The Northwestern Miller.

The Only Weekly Milling Newspaper Published in America.

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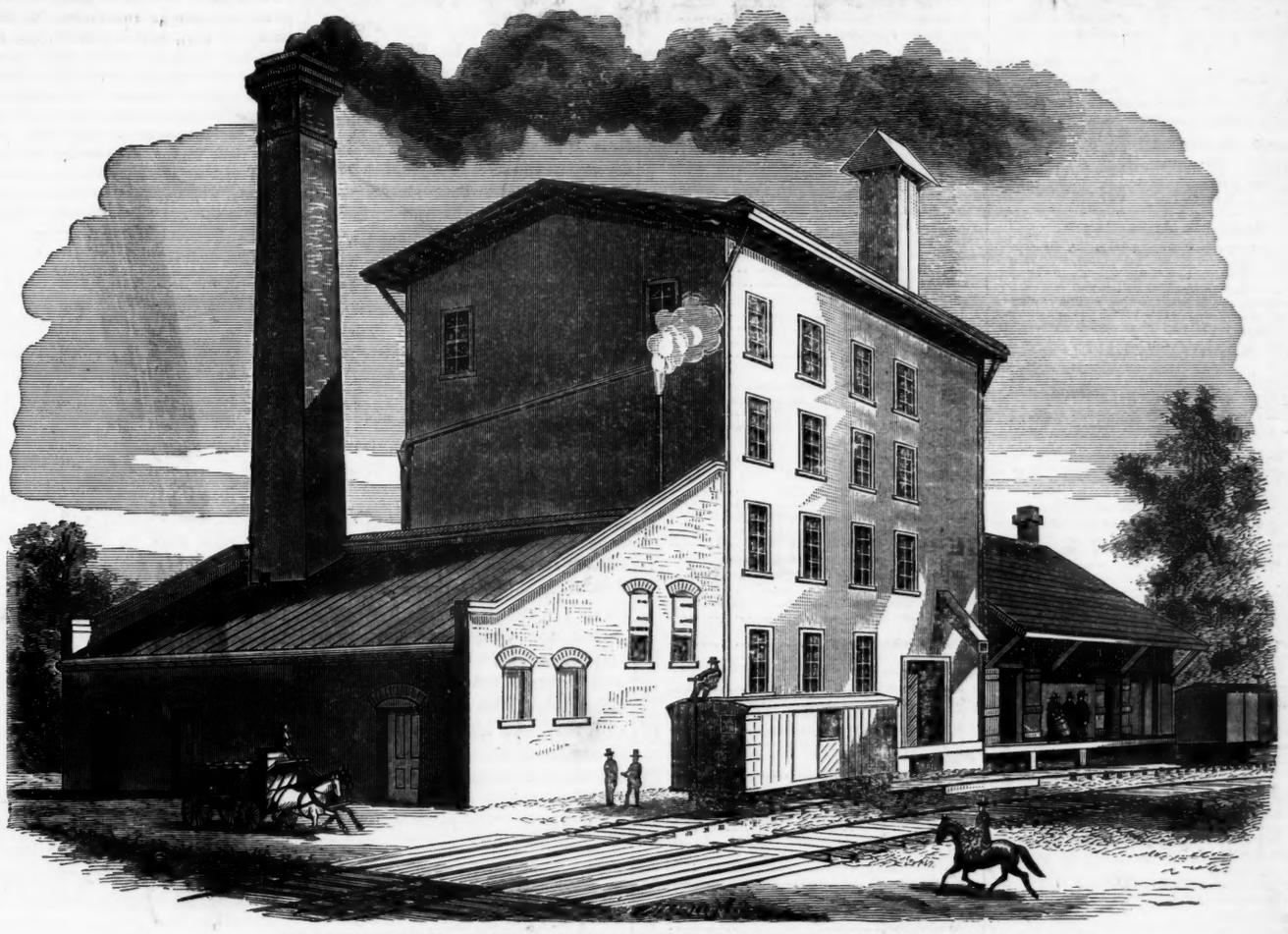

THE NEW GRADUAL REDUCTION MILL OF McKEEN BROS., AT TERRE HAUTE, IND.

GRADUAL REDUCTION!

AS PUT IN PRACTICE BY JONATHAN MILLS.

Full Description of McKeen Bro.'s New Mill at Terre Haute, Ind., and the Manner in Which it is Worked.

Away back, somewhere between the years 1830 and 1835, there was built on Otter Creek, some four or five miles from Terre Haute, Ind., a little water mill. The place is now called Ellsworth, and is located on the Chicago and Terre Haute railroad. The old water mill, one of the pioneer mills in the Hoosier State, has long since disappeared, having been washed away more than twenty years ago. Otter Creek has also disappeared, at least for over six months in the year, although in the wet season it sometimes becomes quite a river. Not a vestige of the old water privilege remains. After the water mill was washed out, a steam mill was built in its place and after experiencing various ups and downs, was purchased about the beginning of the present year by the wide awake milling firm of McKeen Bros., of Terre Haute. With their characteristic energy they at once set about remodeling and improving the property, which task they have just completed, and the mill is now running like a top. As this mill is one of the first mills in this country which is constructed on the gradual reduction system, a description of the mill and its manner of working will be of interest. During a visit at Terre Haute last week we had the pleasure of thoroughly inspecting this mill, and of gathering the following facts concerning it:

The mill, of which the above illustration is an accurate representation, was originally only thirty-two by thirty-four feet and three stories high. To this Messrs. McKeen Bros. have added twenty-four feet in length and one story in height, making the present structure thirty-two by fifty-eight feet, and four stories high above the basement. Twelve feet on the north end of the building is used for the storage bins, three in number, thus reducing the size of the mill proper to thirty-two by forty-six feet, four stories high. The plans were made by Mr. John Webster; the special machinery was furnished by Messrs. Chisholm Bros., of Chicago; the iron work, husk frame, etc., by Noye & Sons; and the work was put in under the careful supervision of George Walterhouse, one of the best millwrights in the country.

Before describing the working of the mill it is right to state that the system of machinery employed is the invention of Mr. Jonathan Mills, formerly of Milwaukee, Wis., but for the last two years with Messrs. Chisholm Bros., Chicago. Frequent mention of his experiments, extending over a period of nearly two years, and of the machinery invented by him, has been made in the NORTHWESTERN MILLER. When they were about deciding upon remodeling the mill, Messrs. McKeen Bros. visited Chicago and were shown the results of Mr. Mills' experiments. They were so well satisfied of their superiority over the best new process milling, and of their practicability on a large scale that they immediately decided to use Mr. Mills' processes and machines in their mill, and the results, now that the mill is in operation, exceed their most sanguine expectations. The "Gradual Reduction" system, or in other words, a system of successively finer granulations, is employed. The system differs from other systems of gradual reduction in that the successive reductions are made on special machines, invented by Mr. Mills, and claimed by him to be superior to any machines that have hitherto been employed for this purpose. For the particulars as to the manner in which the stuff is handled we are indebted to Mr. George Walterhouse, under whose supervision the work has been constructed.

The mill is situated along side of the Chicago and Terre Haute railroad, and most of the wheat required to run it is shipped in from Terre Haute and other points. The wheat is first weighed on the track scales and then emptied into a sink in the basement of the mill. From this sink it is elevated and run through a Barnard & Leas receiving separator, and thence into the storage bins, which have a total capacity of about ten thousand bushels. From the storage bins it is drawn as required, reweighed and passed through a Richmond brush machine. From this machine the wheat is elevated to

Concluded on page 220.

THE NORTHWESTERN MILLER

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Notice to Our Readers.

The columns of THE NORTHWESTERN MILLER are always open to *all* of its readers for the discussion of topics relating to milling. We solicit especially fresh news of fires, failures, new mill enterprises, etc., and always pay for the stamps and trouble.

OSTRANDER, HOPPIN & DEAN,
Minneapolis, Minn.

Our Club List.

In order to meet the wishes of some of our subscribers who have asked us to club our paper with some one or more of the leading Milling and Scientific papers we have arranged with a few of the most important papers. Others will be added to the list as asked for:

	Regular Price.	Club Price.
The Northwestern Miller with		
Scientific American	$6 20.	$5.20.
London Miller (monthly)	4.50.	3.50.
American Miller (monthly)	4.00.	3.25.
The Grain Cleaner (monthly)	4.00.	3.00.

Notice to Advertisers.

The NORTHWESTERN MILLER has double the circulation of any other milling journal published. It is a regular weekly visitor to a large number of the most enterprising and progressive millers and mill owners in the country. In addition to this, a large gratuitous circulation is sent out each week. We have lately made out new and complete lists of the millers, millwrights, etc. in the United States and Canada and shall send a copy of the NORTHWESTERN MILLER to each address at least once a month. *Our rates* of advertising are *lower according to the circulation than those of any other milling journal published.* Address, with copy of advertisement,

OSTRANDER, HOPPIN & DEAN,
Minneapolis, Minn.

ADVERTISERS' DIRECTORY.

NOTE.—Where Advertisements appear "every other week," or "once a month," a blank will be left in place of the page in those issues in which the advertisements do not appear.

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AT THE recent industrial exhibition at Toronto, Canada, there was a good exhibit of milling machinery from both Canada and the United States.

"TIP" CHISHOLM, of the firm of Chisholm Bros., Chicago, Ill., is happy, superlatively happy, so to speak. The cause of his happiness is the advent of an eight pound daughter to share his bed and board, pull his whiskers, keep him awake nights, etc., etc. It's all well enough now, friend Chisholm, and we don't blame you for being elated, but just wait a few years until you have to buy new hinges for the front gate, and keep fire and pay gas bills for the front parlor and it won't feel quite so funny.

THE millers on the James river, in Dakota, are up in arms against one B. M. Smith, who by damming the river at Sand Lake, has cut off the supply of water from the mills below. Four mills which do business for a large extent of country, many farmers hauling their wheat a distance of from ten to fifty miles to have it ground, have been obliged to shut down in the midst of the busy season. The press of that section takes sides with the millers, loudly denouncing Smith's course, which is represented as being part of a land-grabbing scheme.

THE area under wheat cultivation in the colony of Victoria, Australia, according to government statistics, shows an increase for 1878-79 of 93,849 acres. There is a decrease in the yield, as compared with that of the previous season, of 1,302,792 bushels, thus representing a very large decrease in the average yield per acre. The area under oats shows an increase of 28,169 acres, and an increase in the yield of 307,511 bushels. The falling off in the wheat return is principally due to the unfavorable season, but it must nevertheless be regarded as highly unsatisfactory. The total area in the colony under cultivation is 5,292,000 acres, being an increase of 504,000 acres.

WHILE spending a day at the Reliance Works, Milwaukee, Wis., last week, we were much pleased to see that they share in the general business revival, and that work keeps coming in faster and faster. The old Bay State shops are now used exclusively for fitting up and putting together the Gray's patent noiseless belt roller mill, which is now meeting with a very extensive sale. At the time of our visit, the floor was crowded with these machines in various stages of construction. The shop can turn out about two machines a day, and yet Messrs. Allis & Co. are far behind their orders. The roller mill business is, however but a small part of the work done at the Reliance Works. The Reynolds-Corliss engine is another specialty, and the shops have hard work to keep pace with the orders. In addition to these specialties Messrs. Allis & Co. do an extensive business in saw mill machinery, while their prominence as builders and furnishers of flouring mills is well known to our readers. The vast mass of machinery in their shops is kept busily at work night and day, and names of over seven hundred men are on their pay rolls.

A Good Word for the Reynolds' Corliss Engine.

One of the well known Reynolds-Corliss engines built by Messrs. E. P. Allis & Co., of the Reliance Works, Milwaukee, Wis., is now furnishing the power for the machinery department of the Louisville, Ky., Industrial Exposition. The Louisville *Courier-Journal* of Sept. 25th, has this to say about this engine:

"The eastern department of machinery is run by the Reynolds improved Corliss engine, managed by Mr. Albert Lieber. The improved Corliss engine is built by Messrs. E. P. Allis & Co., of Milwaukee, Wis., and is known as one of the leading machines of the country. Mr. Reynolds developed the highest economy and best regulation known in steam power at the United States Centennial, and it will be of great interest to all steam users to take particular notice of the movement of the engine. Quite a number of people have the idea that the machine is quite complicated, but this is not the case; any one wishing to know the principle the machine works on will be initiated by Mr. Lieber. The critic can see where the big saving of fuel is made over an ordinary engine. The attention of visitors is excited every day by the smooth movement of the machine and the exact performances of the regulator. But the greatest attention is excited by the quick cut-off which is caused by the vacuum pot. The machine is so constructed that any part can be adjusted when the machinery is at work. The four valves, two steam and two exhaust, can be taken out and put back in their places again in fifteen minutes. The machine is one of the handsomest pieces of machinery that ever was brought before the public. No one who visits the Industrial should fail to take a good look at this magnificent piece of machinery, which shows the great improvements made in this line within the last few years."

THE description of the new gradual reduction mill, built by McKeen Bros., of Terre Haute, Ind., and just started, which we publish this week, although not as minute in detail as might be wished, is still interesting, and will give to our readers a good idea of the way in which the work is done. A thorough personal inspection of the mill and the machinery employed has convinced us that better and more economical milling can be done in this mill than in any "new process" winter wheat mill we have visited. Having but just started, and that too, upon an untried system, there were some things that were not yet exactly as they should be, and a few changes were necessary to bring the mill fully up to the standard marked out for it. On the whole, however, the mill may be pronounced a decided success, and as such is highly gratifying to the owners, as well as to Messrs. Chisholm Bros., the manufacturers, and Mr. Mills, the inventor of the special machinery employed. For neatness in design, solidity in construction, and perfect running qualities, the machines merit especial mention. So far as tried the reduction and bran machines have worked to a charm, and have not given a particle of trouble. It is too early to predict the exact degree of success with which Mr. Mills' system will meet, but the prospects for a goodly reward for his labor are certainly flattering.

Wheat in Oregon.

Some wonderful stories are told of the enormous yield of Oregon wheat fields. The Portland *Oregonian* tells of one man who harvested fifty-four bushels per acre, while three farms yielded an aggregate of nearly 90,000 bushels. The Chicago *Inter Ocean* says:

"It may not be known that the crop of wheat springing up without sowing the second year is nearly as good as the first in the favored land. The climate of Oregon is so mild that farmers have small use for barns to protect their stock. In Feburary, several degrees north of Chicago, the grass is six inches high, and the cattle luxuriate in the fields of clover. A winter often passes without ice an inch thick, but it rains nearly every day during this period. They call

it an "Oregon mist" but it is very wet. The winter is the growing season of Oregon."

As to the actual condition of this year's crop a San Francisco circular makes the following report:

"The quality of this season's wheat continues to be very disappointing, and falls very much below the expectations of those engaged in the business. We have no reason to change our former estimates of this year's wheat crop in California, but regret having to report that the crops in Oregon, especially the spring wheat in the Willamette valley, have been severely injured by the rust in the early part of August. The extent of such damage is estimated at from 10 to 20 per cent. of the whole crop; but we feel safe in stating that probably the lower estimate of damage is the more correct one. The Walla Walla wheat this season appears to be of very fine quality, and we expect that this kind of wheat will become better liked by European millers. The export movement from Oregon is only just commencing, and so far hardly any Willamette valley has come to market, while the receipts of Walla Walla wheat aggregate a couple of thousand tons."

We reprint this week, on page 224, an article from the Chicago *Tribune* of Sept. 19th, relating to mutual insurance. As this subject is one of importance to the milling public it will be read with much interest. There is no doubt but that the mutual system of fire insurance is much cheaper to the insured and fully as secure as in the best stock companies, provided the mutual companies are honestly and carefully managed. Of late years this point has been so well understood by those parties wishing insurance that no company could obtain patronage unless there were well known and responsible men at its head. Another point in favor of the mutual system is that by it, classes of risks, which in the stock companies have to pay high rates, can be so divided and distributed that an extensive destruction by fire is impossible. In the east manufacturers have largely availed themselves of the benefits of mutual insurance, and it is not strange that the manufacturers of the west should follow their example. The Western Manufacturers' Mutual, referred to in the *Tribune's* article, is organized to give western manufacturers insurance at actual cost. The incorporators, leading directors and officers of the company are all men of sound business standing, and they being such, the company has the confidence of the insured. A larger number of risks have already been taken on the leading flouring mills, saw mills, and other manufacturing establishments in the northwest, and the company will soon be ready to begin business. If the past is any forecast of the future its success is certain.

The Russian Grain Trade.

It is stated on the authority of the *Golos*, a Russian paper, that the exports of grain from Russia this year, are considerably less than last year's. During the first six months of 1878, the exports amounted to 15,813,000 quarters, or about 130,257,250 bushels United States measure; for the first six months of the present year the exports were 13,132,000 quarters, or 107,339, bushels, a falling off of about 12 per cent. Imports on the other hand are considerably larger than last year. The Russian harvest this year, with the exception of a few districts, is not good. In the Kieff district, generally a fertile one, the harvest is very bad, and prices in consequence are high American competition is beginning to be seriously felt by the grain trade of Russia. On this point Mr. Stanley, British consul at Odessa, reports as follows to the British government:

"The objection in the English market to South Russian wheat, is the unfit condition in which it is too often shipped. The greater part arrives from the interior in uncovered wagons, and frequently for want of wagons remains exposed on the railway platforms. Unless the corn can be produced cheaper and brought to Odessa in better condition and the cost of transport and placing on board be reduced, South Russian corn will soon no longer, except in exceptional seasons, find a market in England and western Europe, being unable to compete with American, Indian and Australian corn. During the past year, for instance, owing to the depreciated value of the rouble, purchasers in England had to pay only £1 for what at the normal rate of the rouble they would have to pay £1 7s 6d; yet even thus American was able to undersell Russian corn. To contend with American competition, attention is at length being drawn to the absolute necessity of adopting an improved condition of this trade, and, as the price of grain at its place of production is moderate, and can stand comparison with that of other countries, it would appear that if some scheme which will place the proprietor in direct communication with an export depot which will ship his grain expeditiously and at a minimum cost, can be carried out, a great step would be taken toward retaining the trade which Russia appears on the point of losing. A scheme to this effect has been presented to and approved by the municipality of Odessa, the consent of the imperial government being now further required. The proposal is to build an elevator on the American system, modified to suit local custom, capable of holding 20,000 quarters. Built on one of the moles in the harbor and in connection with the railway, it would give facilities for receiving grain by railway and by carts from the local districts, and also from the barges which bring a considerable amount from the neighboring rivers. It would have all the newest improvements for cleaning and drying grain, so that Odessa grain might be freed from the bad repute it has in the English market of arriving there in worse condition than any other grain."

Local and Personal.

—One of the handsomest cornices in the city surmounts the new "Northwestern" mill.

—Chas. Rodgers, late of Mankato, Minn., has come to this city to take a place in the White & Morrison mill.

—Ed. Pease, in charge of the Pillsbury mills, who went east some weeks ago on account of his father's death, returned to this city on Tuesday of this week and has resumed work.

– The river is now at a lower stage than it has been for years. No water is going over the apron, and but little through the new sluice way. As yet none of the mills have been obliged to shut down.

—Work on the exterior of the Crown Roller mill is approaching completion, and rapid progress is being made with laying floors and otherwise preparing the structure for the machinery, which will soon begin to arrive.

—A young man named James Zeron lost his life at the B mill Monday afternoon. He was sent to work with a shovel in a bin of bran and shorts, and in some way was buried to such a depth that he was unable to extricate himself, and so was smothered. He was twenty-two years of age, unmarried, and came here about a year ago from Osnabrock Center, Ontario, where he leaves a widowed mother who was dependent upon him for support. Mr. Zeron is spoken of by his associates as a young man of good disposition and industrious habits.

—Our sanctum will hereafter miss one of its most pleasant and most welcome visitors, for Aleck Thring, one of the most straight-forward, warm-hearted and wholesouled boys it has been our pleasure to know, died last Wednesday evening at his boarding place, in this city, of typhoid fever. He had been sick for some time, but we indulged the hope that he would weather the storm and come out all right. Mr. Thring came to this city about six years ago, and has been employed for the greater part of the time since then in Messrs. Crocker, Fisk & Co.'s Minneapolis Mills, a good share of the time as second miller, which position he held at the time of his death. He leaves no family, but has a widowed mother, near Guelph, Ontario, who will have the sympathy of the many friends Mr. Thring has made by his quiet, gentlemanly ways during his residence in this city. The funeral of Mr. Thring will take place at 10:30 a. m., Sunday, from the residence of Geo. West, on Fifth street between Seventh and Eighth avenues south. The body will be buried in Lakewood cemetery.

Loss of the Atlas Mills, Oswego, N. Y.

At 12:45 Saturday night the watchman at the Oswego starch factory discovered fire issuing from the basement of the Atlas mill, situated on the Varick canal and owned by Mr. John Dunn. The Kingsford and city bells gave the alarm and the department responded briskly, but the flames ran through the building as if it were a match box—as they go through all such, and to save it was impossible. The entire mill and contents were destroyed. The latter consisted of over 1,000 barrels of flour and about 13,000 bushels of wheat. The Kingsford firemen co-operated with the department and they succeeded in saving all the surrounding property, except the storehouse and rear part of the office of the Ontario mills, owned by M. J. Cummings, and Mr. Baker's lime house. The property belonging to the Ontario mills was saved at the time those mills were burned. There is no intimation as to how the fire originated, the mill being shut down at 9 o'clock in the evening, and there being no fires in the building.

Mr. Dunn bought these mills of Mr. Luther Wright in October, 1876, for $20,500, and had expended $20,000 in improvements, principally for the manufacture of new process flour. The mill and machinery were valued at $40,000. There was $20,000 worth of flour and grain, which woud make a total loss of $60,000. The storehouse and office owned by Mr. Cummings are fully insured.

The insurance on the mill and stock was $52,000, as follows:

On mill and machinery—Newark Fire Insurance company, $1,000; Columbia, $1,000; Peoples', $1,000; St. Paul, $1,000; Hamburg Bremen, $2,500; Standard, $1,000; Commercial Union, $1,000; North British and Mercantile, $2,500; Royal Canadian, $1,500; Shawmut, $2,500; Lafayette, $1,000; Hanover, $1,500; Buffalo, $1,000; Fire Association of Philadelphia, $2,000; Union, $1,500; Merchants', $2,000; Irving, $1,000; Commercial Union, $500; Standard $500; Phœnix, $2,500; Prescott, $1,000; Lancashire, $1,000; Firemen's of New Jersey, $1,500; Ætna, $1,000; Western Assurance Association, $1,000. Total, $35,000.

On stock—Commercial Union, $1,000; Lacasse Generale, $1,500; Granite, $1,500; Hanover, $1,000; United Firemen's $1,000; Hartford, $2,000; Manhattan, $2,500; Mercantile, $1,500; People's, $1,000; Farmer's, $2,000; Firemen's, Baltimore, $1,000; Northern, $1,000; total, $17,000.

Mr. Cumming's insurance was as follows:

On storehouse—St. Paul, $333.33; Royal Canadian, $333.33; Standard, $333.34; Total, $1,000.

On office, furniture and fixtures—St. Paul, $666.67; Royal Canadian, $666.66; Standard, $666.67. Total, $2,000.

The Cumberland mills, Mr. Watson's house and other property were in grave danger, but were saved by promptness and watchfulness. Mr. Dunn was doing an active and excellent milling business, and the loss is a serious one to the city. He is not yet prepared to say whether he will rebuild. Mr. Dunn is a "live" business man, and we assume that, whether he rebuilds or not, he will not long remain out of a job. —*Oswego Palladium. Sept.* 22.

The New York Export Trade.

The volume of domestic exports from this port is very large this season, especially in the line of breadstuffs. At the custom-house the following figures were obtained, showing the total value of the domestic exports during the month of August in each year since 1879:

Year.	Value.
1872	$19,569,529
1873	23,561,890
1874	23,945,467
1875	19,715,518
1876	22,972,298
1877	22,722,250
1878	30,913,782
1879	30,898,203

It will be seen that the volume of the exports in August, 1878, slightly exceeded the corresponding figures for last month, but this trifling falling off in value is accompanied by a large increase in volume, the prices of many domestic products having decreased considerably since a year ago.

In reply to inquiries on the subject Mr. David Dows said that the foreign demand for grain was very large, owing to the general failure of crops in Europe. France has no grain to export, the crops in Russia were not so heavy as usual, and the failure of the harvest in England was well known. In this country all crops were abundant, and the shipments were correspondingly heavy. He believed that Europe would take our surplus breadstuffs at fair prices. Rates were now about the same as last year, but were firm, and the trade was generally in a very healthy condition. Both for the present method of doing business by telegraph and steam power, such news as had come from Europe lately would have caused a heavy speculative rise in breadstuffs in the course of a few days, but not merchants in England and on the continent were about as well informed of the state of market as people here, and they could order their supplies as they wanted them, without fearing a sudden scarcity.

Statistics compiled at the produce exchange show that from the 1st of January to the end of the first week in September of each year the exports of wheat flour were 2,712,955 barrels in 1879, against 1,729,035 barrels in 1878; the exports of wheat 38,957,544 bushels in 1879, against 33,134,164 bushels in 1878, and the exports of corn 24,214,295 bushels in 1879, against 20,589,167 bushels in 1878.—*N. Y. Evening Post.*

The planters of Point Coupe, La., are discussing whether or not they should bring labor from Georgia to improve their lands.

Concluded from page 217.

a rolling screen by which it is graded, according to its thickness, into two grades, and is then ready to go to the reduction machines, invented by Mr. Mills. As shown in the accompanying illustration of the grinding floor of the mill, six of these machines are employed and are driven by quarter twist belts from a shaft running back of the machines. Two machines are used chest of reels by which the flour is taken out. This flour is the second grade or wheat flour, and is of excellent quality. The middlings from this separation are dusted by themselves and are then sent to the same grading reel with the middlings from the first and second reductions. The coarse middlings are purified by themselves, on a set of Geo. T. Smith purifiers. The fine middlings bran machines, shown to the left of the grinding floor, beyond and a little in front of the line of gradual reduction machines. After passing through the first half of this machine the bran is elevated, passed through an agitator and the flour and middlings taken out. The bran then passes through the last side of the double bran machine, and is elevated and passed through another agitator, which takes out the remaining flour and middlings. After this last operation the bran is considered finished and goes to the shipping bin.

The flour and middlings separated from the bran in both these separations are bolted on a special set of reels. The flour goes into the low grade flour, while the middlings are purified on a Smith purifier, and reground with the other middlings.

We have given above, as concisely as possible, the main points in the manner in which the wheat and its products are handled by Mr. Mills. As to the results, it is claimed that from winter wheat from 65 to 75 per cent. of patent flour can be made, while from spring wheat this percentage can be raised to 75 to 85 per cent., while the first or wheat flour will be better than can be made by mill stones. Among the advantages arising from the use of this system to which special attention is called, the most important are these:

First. The dirt on ends and in the crease of berry that cannot be reached by cleaning machinery is easily and thoroughly removed. This part of the work is done in the first and second reductions.

Second. The germ is removed without being cut up or ground in with the flour, and the latter is thereby kept of better color.

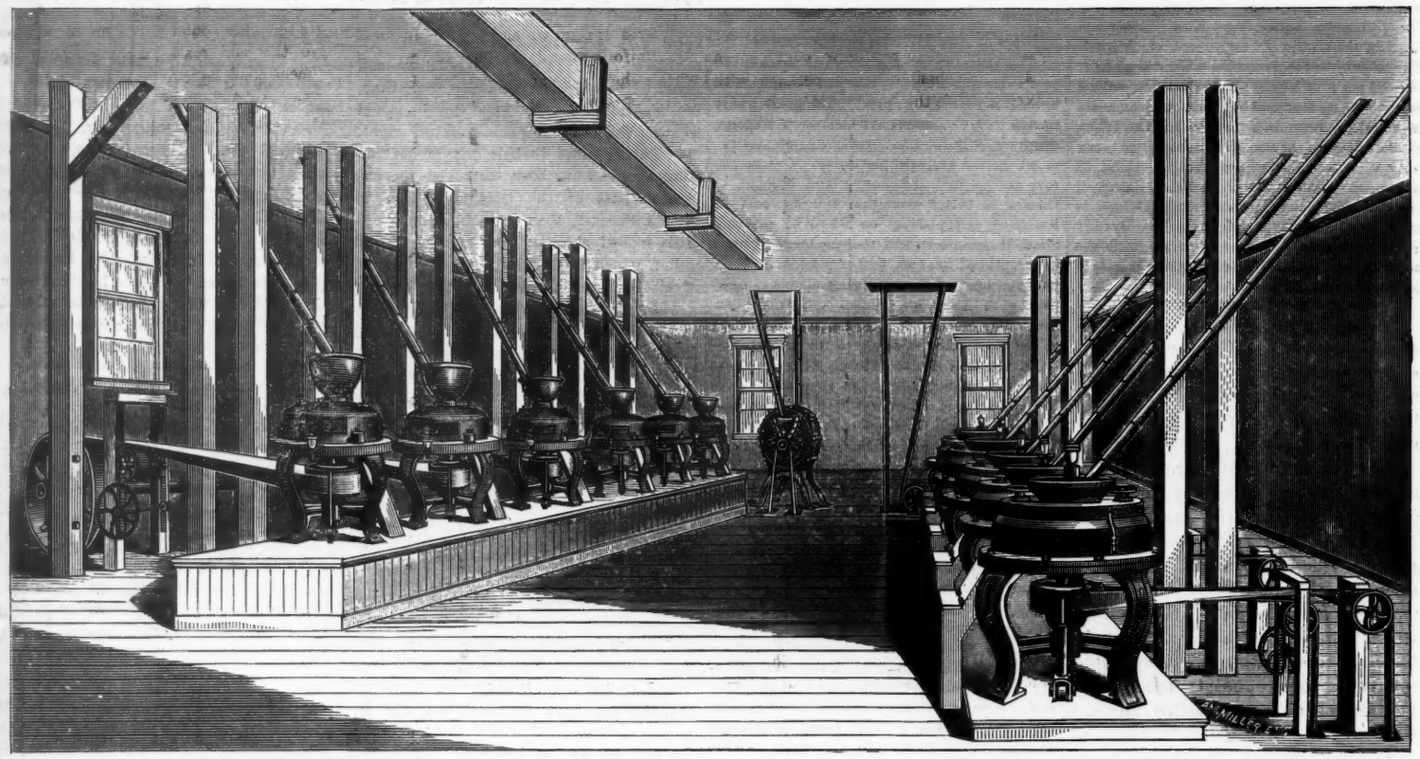
Third. The bran is not cut up or comminuted, as is always the case when the wheat is passed between porous or gritty mill stones or any other substance having a porous or abrasive surface. This avoiding of the cutting up of the bran is one of the most important points in the whole system, and in every detail has been kept constantly in mind. The result is, that there are no bran specks or bran dust to lower the color of the wheat flour.

Fourth. A very large percentage of middlings and a correspondingly small percentage of low grade flour are made.

Fifth. But little cleaning machinery is required. All that is necessary is to remove the smut, cockle, straws, etc. No scouring or polishing is needed.

One novel feature of this mill is worthy of mention. It is fitted with one of Geo. T. Smith's newly patented dust spouts, which device is calculated to allow the purifier fans, etc , to blow freely out into the open air, and at the same time to prevent the escape of any fine dust. It would require a detailed description to show accurately how it works, but it certainly works well.

The mill has a capacity of 250 bbls per day and will be in charge of Mr. Charles Allen, assisted by Mr. Fred Markle as night miller. Although but just started, its operation is so satisfactory to its owners that they contemplating the changing of their large steam mill in Terre Haute to the same system. Should any of our readers wish any further information about the mill or its manner of working, they can obtain it by writing to Chisholm Bros., 276 East Madison St., Chicago, or to Jonathan Mills, Gault House, Chicago.



VIEW OF GRINDING FLOOR OF McKEEN BRO.'S GRADUAL REDUCTION MILL AT TERRE HAUTE, IND.

on the first reduction, to one of which the largest sized wheat is sent and to the other, the smallest sized wheat. The object of thus grading the wheat and using two machines on the first reduction, is that the reduction may be made perfectly uniform and not a single kernel of the wheat escape being split open. The first reduction merely splits open the berry along the crease, and loosens the germ and the dirt in the crease so that they are readily separated before the cracked wheat goes to the second machine. From the first two machines the chop, as it may now be called, is elevated into a short separating reel, clothed with wire cloth, and the flour and middlings taken out. What passes over the tail of this separating reel is sent to the second reduction machine, which is set a little closer than for the first reduction. The chop is elevated to a second separating reel, the flour and the middlings taken out, and the stuff that passes over the tail of the reel is sent to the third reduction machine. This process is repeated until five reductions have been made, the flour and middlings being taken out after each reduction.

The flour and middlings from the first two reductions are sent together to a special set of separating reels. The flour taken out is small in quantity and of low grade. It is spouted direct to the packer. The middlings from this separation go to a dusting reel, thence to a grading reel by which they are separated into two grades, coarse and fine, and from which they go to the purifiers. The flour and middlings from the third, fourth and fifth reductions go together to a special are also purified by themselves on Smith purifiers.

The purified middlings, after passing the machines, are elevated to the garners above the middlings stones, on which they are reground the same way as in the best new process mills. The cut of the grinding floor shows five middlings mills, a new invention by Mr. Mills, and which combine in a marked degree, solidity of construction, with ease and perfection of running. At present, however, these mills are not in use, not having been tested sufficiently so that they could be built in time for use in this mill. The cut is intended to show the grinding floor as it would appear were all of Mr. Mills' plans fully carried out. At present the coarse middlings are reground on two run of forty-two inch French buhr mill stones and the fine middlings on two other run of the same size. These stones, together with a "pony" run for regrinding the low grade stuff, are set upon a substantial iron husk frame and driven by quarter twist belts from a line shaft in the basement. The chop, after passing the middlings stones, is elevated to a chest of reels and bolted. The flour which is taken out is the first grade or "patent," and is both large in quantity and excellent in quality. The tailings from the purifiers are worked up on rolls, in order to get rid of the germ, as is now generally practiced in new process milling.

The tailings from the separation which follows the fifth reduction are mostly bran, but which, as it contains some middlings and other adhering particles, may not properly be considered as finished. It is, therefore, sent through the first side of one of Jonathan Mills' double

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"Now, ladies and gentlemen," shouted the book agent, "before the picnic concludes I want to sell every one of you a copy of the 'Life of Pocahontas'. She was an Injun girl, Poky was—they called her Poky for short—but she wasn't the kind that went around peddling baskets and blow-guns. Not frequently. She stayed at home playing croquet in her front yard, or went to the Ladies' Aid Society, and didn't take no copperas off o' nobody. The celebrated John Smith came traveling through them parts as agent for a family paper, but Poky wouldn't let her father raise a club. She married Smith afterward, and the last act of her life was to die of consumption." Just here Officer Sammy Jones approached with a shot-gun and the meeting adjourned.

THE THEORY OF ROLLER MILLING.

Translated from Gustav Pappenheim's "Popular Treatise on Milling."

The efficacy of millstones, as we have seen, is not accidental or arbitrary, but is governed by certain rules, which may be determined on mathematical principles, if not with perfect exactitude, at least with a tolerable degree of accuracy.

The same rule holds good with rollers, only in this case the comparative newness of their introduction has prevented similar experiments being made as with the stones, and the few theories which have been advanced by competent judges have been opposed by those of other experts who were quite as competent to express an opinion on the subject.

If we consider, in the first place, the difference betwen the work of the rollers and of the stones, we find it to consist principally therein, that the rollers accomplish the reduction more by a squeezing or bruising action, while the stones have more of a grinding action. In this respect the rollers possess the great, advantage of not tearing or rubbing the husk of the berry, but of squeezing it; and further, the feed is in only a short time between the rollers, which prevents its heating and having any injurious effect on the flour, as is the case with the stones. This is the reason why it is said that "rollers grind cold." The advantages of rollers in comparison with stones are therefore very important, and it will easily be understood that the rollers, as a matter of fact, are destined to play a great part in the milling trade.

If we follow a grain of wheat, or a portion of it, in its passage through two rotating rollers, we find, first of all, that the berry is seized by the power of adhesion at a certain point, depending partly on the dimensions of the rollers, and partly on the size of the berry. The action which the rollers have upon the berry varies according to the nature of the rollers and the construction of the mill. If both rollers are constructed in such a manner as to admit of the one or the other being withdrawn or approached by means of a screw or lever, the movable roller during the operation will neither be able to give way nor to exert an active pressure. The particles of the feed, therefore, at the first point of contact, will receive no pressure from the side of the moveable roller, but only from the drawing-in action of the two revolving rollers, supposing, of course, the necessary adhesion to exist. The squeezing pressure which is thus exerted on the grain is produced in this case entirely by the gear of the rollers, because, through the rotating motion, and by being carried forward by its power of adhesion, the grain is drawn into a gradually decreasing compass, and must there be crushed or squeezed. This reduction takes place regularly if both rollers possess an equal speed. Should the rollers be driven with differential speed, an unequal impelling motion is given to the feed, and a greater friction results, whereby the product acquires another nature. When the speed is equal, the product leaves the rollers in a broad, flattened form, whereby the outer hull or bran remains tolerably uninjured, but still part of the kernel is pressed into the folds. With differential speed, by which a friction takes place, the lamination is naturally not so great, but the hull is cut in a greater degree. If the arrangement of the rollers is such that they may be approached to one another at will, by means of a lever or springs, and in this manner be made to exert an active pressure in contradistinction to the passive resistance of the fixed rollers we find at the first point of contact a pressure on the grain from the side of the movable roller. This squeezing action is therefore produced, not only by the revolving of the rollers, but in a great measure by the pressure which is exercised by the levers or springs. The first noticeable result here is the diminution in the amount of power consumed, in comparison with the rollers with fixed pressure. This active pressure tends also to increase the adhesive power of the rolls, and to render an equal speed of the same possible, where, perhaps with a fixed pressure the feed would enter badly or not at all. Again, with the self-acting pressure a distinction must be made between the arrangement where both rollers revolve at the same speed, and where they revolve at unequal speeds.

If the speed is uniform, a commensurate advance of the crushed portions of the berry at both points of contact takes place between the rollers. If the rollers have differential speed, a displacement of the inner part of the particles of the berry will consequently result, whereby the struture will be loosened. In this case, undoubtedly, friction takes place between the several particles of the flour, and the grain is therefore attacked in a greater degree by the rollers than when working with uniform speed, but under all circumstances less than by differential speed with fixed rollers. If, on the other hand, the construction of the mill is such that only one roller of each pair is driven, and the other, which is pressed by the lever or springs, is carried forward by the friction, supposing this friction to be sufficient to prevent any slipping, the roller which is being carried forward by the friction will attain theoretically the same velocity as the driven one. In actual working this condition will not often be fulfilled, because the feed may not enter regularly, and the material of the roller may not be so even as to exclude all differences. In such a case it would happen that many points of the roller would remain behind, thus creating a kind of differential speed; but such a case should not occur if the rollers are properly constructed and in good working order. As regards the action of the pressure where only one roller revolves, it is to be observed that this pressure, which exercised by the lever or by the springs, must serve not only to produce the friction, but also to reduce the grain. If, therefore, the pressure which is requisite for causing the one roller to revolve on the other, is greater than that requisite for reducing the grain or the middlings therefrom, it is evident the grain will be crushed in a higher degree than is desired, and at the same time a larger amount of power will be consumed than would otherwise be necessary. If, however, the pressure requisite for producing this frictional action is smaller or equal to that necessary for reducing the grain, the rollers will be carried round, without any detrimental results. The former case would most likely happen when grinding soft middlings, and the latter when grinding hard middlings. At any rate, this view seems to be supported by the fact that in Austria-Hungary where hard wheats are ground, the frictional roller is employed, while in Germany, where they have soft wheats to grind, it is not held in much favor.

From what has now been said we may arrive at the following conclusions:—

1. Rollers of large diameter draw in the feed better than those of smaller diameter.

2. Rollers with a fixed or unyielding pressure cause greater friction than those with self-acting pressure, consume, therefore, more power, and rub the grain more than the latter.

3. Rollers with differential speed cause a better loosening of the particles than those running at equal speed; but they cause a greater amount of friction, a fact which may be disadvantageous when working branny products, but may also be serviceable when grinding middlings and semolina.

4. In grinding hard wheat and middlings therefrom, where one roller drives the other by friction only, the system is identical with that in which both rollers work at a uniform speed; but in grinding soft wheats they may exercise too great a pressure, and consume more power than is necessary.

In making use of these theories in practice it must be borne in mind they are based on the supposition that the feed enters along the whole length of the rollers in an even stream, which may be considered as a single grain. Still this cannot always be the case, because the stream of grain is not even, nor can it be looked upon as a single grain. A certain friction takes place among the particles of the middlings which tends to modify these theories, inasmuch as the proportion of pressure on the particles of feed in the middle varies from the pressure exerted on the particles next the rollers, the latter being more crushed. The entry of the feed should, therefore, not be forced, for in this case either a portion of it, as has been demonstrated in practice, will pass through the rollers unground, or a stronger pressure will have to be employed, which would alter the result desired.—*London Miller.*

The Profane Parson.

Once upon a time, in the dark ages of the nineteenth century, there lived a gentleman who held a commission in the army.

But he had serious scruples as to whether it was right or wrong to kill his fellow creatures at the bidding of others: or, in fact whether it was not a crime to kill his fellow men at all.

He decided that it was wrong, especially the glitter and tinsel thrown about the murderous profession; so he sold his commission and entered the church, thinking that as he was an intelligent man, and not a mere machine, he might do more good to humanity in that line than in the other line.

One day, discoursing to a rustic congregation on the folly of using profane language, he told them that he himself was once guilty of the same folly, and addicted to the same vice, but that he had completely overcome the habit.

A flying insect, hearing the boast, winked his eye at the congregation, and thought, "I will put him to the test." So, making a circuit of the gentleman's head, he lit upon his nose.

"See!" said the reverend gentleman; There is an illustration. At one time I would have sworn awfully at this fly, but, look now: raising his hand he said gently: "Go away little fly! go away!" but the fly only tickled his nose the more.

The reverend gentleman, raising his hand with some vehemence, made a grab at the offender, and being successful, opened it to throw the insect from him, when in extreme disgust, he exclaimed, "Why, —— it, it's a wasp."

A Portland, Maine, lady recently conceived a simple improvement to a sewing machine, which most of the companies have adopted, and the lady receives in royalties about $10,000 as the result of her "happy thought."

The Butcher and the Lawyer.

A butcher in a provincial town, called the other day upon his friend, the lawyer, to consult him upon the following points: A lady had just been in his shop buying a bit of beef for her husband's dinner. Her pet dog, which accompanied her, forgetting its good manners in the shop, had, either in snuffing at or tasting a nice roast, tumbled it among the sawdust where with the floor was strewn, and soiled it. His question to the lawyer was:

"Is the lady bound to pay me for and receive the said roast, and if so, how may payment be enforced?"

The lawyer inquired if the lady was a good customer: and being answered in the affirmative he said:

"My advice to you, as a friend, would be not to enforce payment of the $1.75 (for that was the full value of the roast), because, if you do, you will most likely lose the family's custom, and that of some of their friends. But, when the lady's husband looks in, you may take an opportunity of mentioning the circumstance to him in as gentle and polite a way as you can, and very probably he will pay it at once."

"I dare say you're right; I'll just follow your advice, and take the liberty of telling you the lady was your own wife."

The lawyer gave a good-natured laugh, put his hand in his pocket and paid the $1.75. The butcher went away in great glee; for he was proud of his shrewdness in "doing" the lawyer. In his exultation he hurried to his neighbors, the confectioner, the grocer and the apothecary, to tell them of the capital joke; and great was the chuckling of those cronies over it. The butcher's dreams that night were pleasant, and on the morrow his temper was placid and serene; he mused of spending the half-crowns in treating the grocer, confectioner and apothecary. While in this delightful mood the postman handed him a note. It was from his friend, the lawyer, and contained an account:

"A debtor to D—To consultation, $5.25."
—*Phila. Times.*

A Practical Joke.

Joe Skinner was once the greatest joker in Oil City, and one of his tricks came near bringing on a riot one day. Joe was walking along Seneca street when he suddenly stopped and began poking in the mud with his cane, at the same time allowing his other hand to slide over his shirt bosom as if inquest of something which was there. His movements quickly attracted a bootblack, who ran up and asked:

"Lost suthin', mister," and began looking about.

Then came a merchant and two clerks out of the store and began looking up and down the walk. A teamster jumped off his wagon and joined. A barber remarked, "Was it your diamond pin, Joe?" and this was caught up and echoed among the crowd which had gathered, until the story grew that a diamond pin worth $2,000 had been lost. The crowd extended until it filled both sides of the street, and all manner of suggestions were made. One man proposed to shovel up all the dirt and mud and have it carefully looked over. Another said the sidewalk ought to be torn up. A man crowded into a place and trod on the toes of another man, who gave him a push. A blow followed and a fight took place, and in two minutes the police were hauling a man off to the lockup, while Joe got outside the crowd and laughed at his awful hoax until the tears ran down his cheeks. The search continued for two hours.—*Oil City Derrick.*

XUM

Milling News Items.

Mr. Sears, of Shopiere, Wis., is repairing and improving his mill.

A large acreage of winter wheat has been sown in Wisconsin this fall.

Mr. Maind, of Afton, Minn., has completed a new race for his mill.

A grist mill and bakery are being built at Rosebud Indian Agency, Dakota.

Wheat receipts at Stillwater, Minn., are not equal to the demands of the mills.

The acreage of wheat sown in Illinois this fall greatly exceeds that of last year.

The 200 horse power engine for the White Listman mill at La Crosse, Wis., has been received.

Mayo & Co., of Cascade Mills, Osceola, Wis., have nearly completed the new race and dam.

Guy Stearns, the little boy recently hurt in the flouring mill at Bingham Lake, Minn., is dead.

The September report of the condition of the wheat crop indicates an increase over the yield of 1878.

The value of the product of the flour and grist mills at Augusta, Ga., is estimated at $1,500,000 per annum.

The mill of Messrs. Perry & Co., of Banaghir, Ireland, which was recently burned, is to be rebuilt.

The Stillwater mills at Stillwater, Minn., received an order from Boston for 1,400 barrels of flour last week.

The Junction mills at River Falls, Wis., were shut down last week for the purpose of putting in new machinery.

The millers and flour dealers of Davenport, Iowa, have advanced prices forty cts. per barrel on all grades of flour.

W. D. Washburn & Co., have commenced work on their new flouring mill at Anoka, Minn. The mill is to cost about $75,000.

Vessels clearing from Duluth on the 28th ult. carried 1,700 barrels of flour, 5,140 sacks of export flour and 40,000 bushels of wheat.

It is estimated that ten times the number of acres of fall wheat have been sown this fall in central and southern Iowa that was sown last year.

The New York grain trade on Sept. 29th, adopted a resolution changing the time to begin buying and selling grain by the cental from Oct. 1st to Jan 1st.

At the Pierce county, Wis., fair, held Sept. 18th and 19th, Fred Endorf took premiums for the best sack of wheat flour and best sack of rye flour.

The milling firm of R. Gregg & Co., at Cannon Falls, Minn., is changed to Gregg & Vose. Mr. Vose has leased Mr. Grosvenor's interest in the business.

The mill of Messrs. Singleton and Sons, of Birkenhead, England, which was destroyed by fire some time ago, is now being reconstructed, and will be an eight-run mill.

The new four run steam mill of the Wadena Flour Mill company, at Wadena, Minn., is nearly completed. They expect to start up immediately and run day and night.

The contract for framing and inclosing the building for the new flouring mill, at Winona, Minn., was awarded last Tuesday, to Messrs. Noonan & Stellwagen. The work is to be done by the first of December.

Angus Smith's elevator, in Milwaukee, was set on fire by a stroke of lightning last Saturday morning. Damage amounted to $2,000. The elevator contained 300,000 bushels of wheat and 150,000 bushels of other grain.

Emerson, Sherman & Co. have commenced the erection, at Sioux Falls, Dakota, of an elevator with a capacity of 20,000 to 25,000 bushels. Sanborn & Follett of Sioux City, are talking of building an elevator at the same place.

The Gate City flouring mill at Winona, Minn., under the management of J. D. Emerson, lessee from H. W. Lamberton, is being enlarged and improved. New machinery will be put in, and the capacity of the mill increased to from six to eight hundred barrels per week.

The flouring mills on Lowe's creek, Wis., are at present runningto their full capacity to meet the demand of the local trade. John Kelly's Washington mill is about to be increased in its manufacturing capacity, with another run of stone, which will make the fourth in that flouring mill.

The Milwaukee chamber of commerce has established a new grade of wheat to be designated No. 2 hard spring wheat, which wheat must be sound and reasonably clean, composed mostly of the hard varieties of spring wheat, and weigh not less than fifty-six pounds to the measured bushel.

The Albert Lea, Minn., *Standard* says: Wm. Morin has thrashed from his 1,800 acres of wheat in this county 6,000 bushels, and expects to thresh 12,000 bushels more. The highest yield he has yet received is sixteen bushels per acre, and the lowest ten bushels. The yield where he sowed Northern Pacific wheat is the poorest.

Messrs. Kimball & Beedy's mill at Forest City, Minn., has been entirely refitted and refurnished at a cost of from $5,000 to $6,000. The dam is repaired, the flume is rebuilt, and a new water wheel put in. Two new bolts are added to the equipment of the mill, and everything is in first class order for making both fancy and straight grade flour.

The Greeley *Tribune* gives the following account of the yield of wheat per acre in a number of cases in Weld county, Colorado: Sixty acres produced 33⅓ bushels per acre; fifteen acres of this lot produced 47 bushels per acre; thirty-four acres produced 35 bushels per acre, and 30 to 40 bushels per acre seems to have been about the common yield through the county.

The new town of Mitchell, Dakota, has a flouring mill in course of construction. The Mitchell *Capitol* says: "We visited the mill site owned by Scofield & White Bros., a few days since, and found that the work was being pushed as rapidly as thoroughness would permit. The proprietors of this mill are unusually efficient millwrights, and our people may expect in due time at this point, one of the most thoroughly equipped and managed establishments in southeastern Dakota."

Mr. Atwater, and employe in Kimball & Beedy's mill at Forest City, Minn., had a narrow escape last week. The set screw of a collar on the shaft in the attic caught in his clothing and twisted him up so that he could not escape until the machinery was stopped. His clothing was almost entirely torn from his body, but owing to the fact that the collar slipped on the shaft, he escaped with to more serious injury than a few slight bruises. But for the slipping of the collar he would certainly have been killed.

A prominent and practical miller of this county calls our attent on to the fact that the Clawson wheat, of which so much is grown in this part of the state, is not worth as much in the open market by ten cents per bushel, as the hard red varieties, and some millers do not want it at any price. As the time of sowing wheat is at hand this subject should receive the attention of our farmers, and the matter should be considered in selecting seed wheat. Our nformant says that a great desideratum among farmers at the present time is a first class article of seed, and it might be worth while to send to the west or northwest for good Mediterranean seed. The subject is a very important one.—*Doylestown, Pa., Democrat.*

Extensive changes and improvements are in progress at the steam mill of Harmon, Holmes & Co., which will render it, when completed, one of the best equipped and most convenient mills in the state outside the city of Minneapolis. This mill has now a most enviable reputation through the excellency of its manufactures, not only at home and in the east, but in the markets of Glasgow, London and Liverpool, to which ports consignments are regularly made. Its well known brands of "Harmon & Holmes Best" for its domestic trade, and "Gold Medal," "First Premium" and "Trefoil" for shipment and export, have no superiors and always command the highest prices in the markets of the world. There is, perhaps, no single enterprise in the Sauk Valley which is doing as much to spread its agricultural reputation, for certainly it is argued where such flour can be produced the best of wheat must be obtainable. Last season the capacity of the mill was materially increased by the addition of several sets of rollers, improved purifiers and other modern appliances and now it becomes necessary to rearrange the interior of the structure, and increase its available room in order to render the recent improvements more serviceable. Heretofore a portion of the mill building was used for a dust room, but it has been found necessary to utilize that space for other purposes, and a dust house is in process of erection in the top of the mill. It will be 16 by 50 feet and 14 feet high. In addition to this, a number of minor changes will be made, and when completed the total capacity of the mill will be two hundred barrels a day —over sixty thousand barrels per year. The entire cost of the changes requisite to bring it up to this point will reach about nine thousand dollars.—*Sauk Center Herald.*

Manufacturing and Trade Items.

Messrs. E. P. Allis & Co. will furnish a compound Corliss engine for Al Mowbray's new mill at Winona, Minn.

J. S. Manning, of the Columbus, Wis., mill is putting in porcelain rollers furnished by E. P. Allis & Co., of Milwaukee.

W. T. Pyne, Louisville, Ky., has ordered of Chisholm Bros., Chicago, Ill., one of Jonathon Mill's double bran machines.

The Reliance Works, of Messrs. E. P. Allis & Co., Milwaukee, Wis., have the contract for re-modeling the "Star and Crescent" mills in Chicago, and putting in a large number of porcelain and iron rollers.

The new White-Listman mill at La Crosse, Wis., and the new City mills, in this city, are being supplied with the Behrn's patent exhaust and mill stone ventilation by Messrs. Cross and de la Barre, the general western agents.

The old Trenton (New Jersey) battle ground has been selected by Mr. Edmund Craft as the location of his new four run new process mill. Of course Mr. Craft comes west for his machinery. The Richmond City Mill Works have the contract for the outfit.

It is believed that fully one thousand silk operatives have arrived at Paterson, N. J., this year from English, French, German and Italian cities, attracted by reports of the prosperity of the industry of that city. Lately thirty silk spinners arrived in one party from an English tow, and it said a great many more are coming soon.

Late Milling Patents.

A list of United States patents, issued to inventors of milling machinery and milling processes, for week ending September 23, 1879. Reported expressly for the NORTHWESTERN MILLER by A.H. Evans & Co., patent solicitors, Washington, D. C. Attorn y's fee in patent cases $20. Patent Laws sent free on application.

Smut machine; 219,904—C. H. Brazeal, Tye River Depot, assignor to himself and R. A. Ewing, of same place. Smut is usually present in thrashed wheat in two forms—namely, it may adhere closely to the wheat-kernels or be loosely disseminated among them. In order to remove the smut, the ordinary practice has been to subject the wheat to the action of the rubber alone. The result is that while the smut which adheres to the wheat-kernels is removed more or less perfectly, the loose grains of smut are exploded or broken up by the action of the teeth of the rapidly-revolving rubber, so that the quantity of fine smut mingled with the wheat is so great that the blast to which the wheat is subjected upon leaving the rubber is ineffective for its complete removal. Hence, some portion of the smut remains in the wheat, and finally appears in the flour produced from it, thus detracting from the whiteness and to a proportionate extent lessening the market value of the flour. To avoid this result, grain has been subjected to the action of a blast before passing to the rubber or smutter, and this invention is an improvement in that direction. The claim is:

In smut a machine the combination, with a blast-fan, and inclined trough, and a spread board of a smut-tube, provided with divider and blast-guide situated in its mouth, so that the blast passes up the trough and beneath the spread-board and divider, whereby and induced current of air is produced through the grain before it reaches the spread-board, and a blast through the same after it leaves the spread-board, as set forth.

Oat meal meal machine: 219,916—George H. Cormack, Rockford, Ill., assignor to A. M. Johnston & Co., of same place. The object of the invention is to produce clean, sharp gritz, by rapidly cutting the hulled grain into sections, uniform in size as near as possible. The claims are—

1. In an oat-meal machine, the combination, with a rotary cutter or cutters and a fixed cutting plate, of a reciprocating feed-plate adapted to be moved at right angles to the travel of the rotary cutters, said feed plate provided with openings for causing the grain to be fed lengthwise to the cutters, substantially as set forth.

2. In an oat meal machine, the combination, with a cylinder furnished with cutter blades, arranged lengthwise thereon, and a fixed cutter-plate, of a reciprocating feed-plate, located in the hopper, and provided with openings for causing the grain to be fed lengthwise to the cutters, and a cam-wheel, anti-friction roller, and spring for imparting a reciprocatory movement to said feed-plate, substantially as set forth.

Water Wheel Governor; 219,923—N. M. Dibble, Birmingham, Conn., assignor to himself and L. A. Dolph, of same place. The invention consists in combining with a speed governor for water wheels a pivoted arm connected with the gate stem and fitted to act upon the sliding shaft of governor; also in combining, with wheel-stem, shaft, and balls, a lever, nut, and bearing block.

A Maryland farmer thinks he has found a "sure cure" for the Canada thistles. It consists in sowing the land infected with them, with buckwheat early in the spring, allowing it to grow till it is in full blossom, turning it under and again reseeding with the same grain. The last crop is harvested when ripe.

The Trouble in Canada.

The St. John *Telegraph* remarks that the law imposing a duty on wheat "is positively a dead letter at Montreal, but the duties on all breadstuffs are in full force in the Maratime Provinces." This and other signs indicate that an angry feeling is rising in the east in consequence of the unequal administration of laws that would be abomniably partial even if carried out fairly. Ontario people are apt to consider that the recent bestowal of immense privileges upon a few of the leading millers is an injustice only to a few country millers in their own province. This is a mistake. The milling interest is a much larger one, and its followers are much more widely diffused than is generally imagined. Ontario does not contain all the millers in the Dominion —not even a majority of them. In 1871 there were 951 flour and grist mills in Ontario, against 810 in Quebec, 233 in New Brunswick, and 301 in Nova Scotia. There are consequently 2,295 establishments affected by the recent order in council, which in effect gives a monopoly of the flouring business of the whole country to the mere handful of millers who are situated so fortunately that they can export flour and compete in foreign markets against American millers, situated under just as favorable circumstances as themselves. Each of these 2,295 milling establishments gives employment to several men, and most of them are the *nuclei* of villages which furnish the home market of which we used to hear so much. The aggregate value of the business annually done by these mills is not less than $40,000,000. These figures will give some idea of the magnitude of the change which the government proposes to accomplish when it undertakes the task of concentrating all this enormous business in a few favored hands.

The maratime provinces and Quebec will be injured by the revolution even more than Ontario will. At least Ontario millers can buy plenty of home-grown wheat at the same price as if the N. P. had never existed. It is true they can be beaten out of business by the competition of the government proteges, who have the run of American, as well as Canadian wheat fields. But they at least can fight for their lives. As respects the other provinces, the home growth of wheat is insignificant. If the 1,300 mills in these provinces are not to be closed up, American wheat and corn must be brought in, and duty paid upon them. The maratime millers will not, any more than Ontario country millers, get from the government a year's credit on a large part of their capital, nor will they be freed from paying duty on the offal; nor yet will they have the very great advantage of being able to export, at any time the market may suit, such an amount of flour as the government humorously calls the "equivalent" of the amount of wheat imported. The upshot of the matter is that every miller in the Dominion can be bankrupted and driven out of business as soon as our bran new flour aristocracy choose to do the business for them.—*Toronto Globe*, Sept. 12.

Edison's automatic telegraph is described in the October number of *Scribner's Monthly*. Apparently you play upon it with your fingers like a type writer, when it punches certain dots and dashes in a piece of paper. This paper is wrapped upon a roller belonging to the sender, and a point connected with the circuit wire passes around it. In passing over the punched holes the circuit is made and broken and the marks reproduced upon sensitive paper at the other end of the line. Its advantages are speed and convenience.

Varieties of Wheat.

By Chas. Y. Lacy, Professor of Agriculture at Minnesota State University.

For the purpose of ascertaining the relative yield and other characteristics, fifteen different varieties of wheat were this year sown side by side in strips 430 feet long, and 13½ feet wide. This form of plat gave to all the same varieties of soil as nearly as possible. Scotch Fife is the variety to which the others are compared, and in order that none or the other kinds should be too far removed from the standard of comparison, two plats of this variety were sown. The following table is divided accordingly:

Name of Variety.	Yield per acre in bush. of 60 lbs.	Yield compared with Scotch Fife taken at 100.	When ripe.
I.			
Lost Nation	15.6	125	July 28
China Tea	15.0	121	"
White Fife	12.0	96	"
Defiance	10.7	86	"
Scotch Fife	12.4	100	"
Golden Globe or Red-fern	12.9	104	"
Judkin	13 6	109	"
White Russian	13.6	109	"
II.			
Brooks	11,3	80	"
Champlain	12,6	89	July 25
Eldorado	8.6	61	" 31
Scotch Fife	14.1	100	" 28
Saxon Fife	11.9	84	" 28
Sherman	12.3	87	" 22
Australian Club	6.9	49	" 26
Touzelle	9.8	69	" 23

Some may find the numbers of the second column more convenient to compare than those of the first. An illustration will make them clear. Supposing the yield of Scotch Fife to be taken at 100, then the corresponding yield of Lost Nation will be 125, of China Tea, 121, etc.

The seed was sown Apr. 15th, with a seeder set to sow 1½ bushels to the acre, but the quantity sown was not uniform, as already explained in these papers.

The soil was loam or clayey loam, and plowed just before sowing. It had been cropped with wheat for many years continuously.

We are frequently asked which of these varieties we find to be the best. We are compelled to answer that we know of none superior to Scotch Fife. Lost Nation yields better and is a good variety in many respects, but the grain is soft, and, therefore, objected to by many of the millers. The same may be said of Judkin and White Russian, China Tea (Rio Grande and Mediterranean) also yield better, but besides having soft grain, the straw is not stout, and the grain shells easily.

Another question relates to the success of the newer varieties. The table would appear to render comment unnecessary. It has, however, been suggested that having been recently brought from a different climate and different soil, they are showing at a disadvantage, and may give better results after a few generations in this soil and climate.—*Farm and Home.*

One day last week John Henry McShingle might have been seen going down First street, with a bag of potatoes slung over his shoulder to feed Mrs. Mc. and the little McShingles on, who live in Jeffersonville. And he reached the ferry dock and then he made a rush for a boat which he saw about three feet from the dock. He had put on all steam, and when he stopped in his mad jump his bag of potatoes flew over his shoulder and knocked down a dozen passengers besides making a young man swallow his cigar. "I caught the boat, anyway," said John H., when he put himself together again. "Caught the boat!" yelled one of the knocked down passengers in great wrath. "Why you blanched idiot, this boat was coming in."

Such cotton factories as have been established in Mississippi are yielding 20 per cent on investment.

General News.

Pennsylvania is suffering from a serious drouth.

Feist, Frank & Co., a San Francisco grain firm, failed last week.

A general strike of coal miners in Iowa and Illinois is anticipated.

Many emigrants are returning from Kansas to Wisconsin and Iowa.

A vein of gold bearing quartz has been discovered in New Brunswick.

The journeymen tanners at Pittsburgh, Pa., have struck for higher wages.

The treasurer of Martin county, Minn., is out about $4,000 in his accounts.

A party of twenty-eight prospectors have been massacred by indians in Utah.

Recent heavy frosts have done great damage to the Michigan grape crop.

The little town of Livermore, Ky., was almost totally destroyed by fire last Saturday.

The Massachusetts medical society at a recent meeting resolved to admit women to membership.

A heavy hail storm at South Bend, Ind., last Saturday night, seriously damaged the growing wheat.

About 1,500 cabinet workers and mechanics at Cincinnati, are on a strike for an increase of wages.

It is estimated that from 50,000 to 65,000 square miles of the area of Montana is underlaid with coal.

The public stock exchange of Todd, Williams & Co., of Philadelphia has suspended. Liabilities $25,000.

A large corn syrup refinery company has been organized at Des Moines, Iowa, to begin business at once.

The Keystone yarn mill at Philadelphia, was damaged by fire last Wednesday night to the amount of $35,000.

The United States mint at Philadelphia, Pa., coined 1,808,050 silver dollars and 14,737 minor coins during September.

The entire business portion of Carroll, Iowa, was destroyed by fire, Sept. 25th. Loss, $200,000; insurance $30,000.

The Mercantile Mutual, one of the oldest marine insurance companies in New York, has voluntarily gone out of business.

Peter Cooper is going to add another story to the Cooper Union building for the accommodation of the Inventors' Institute.

The warehouses of the Wilmington Compress company at Wilmington, N. C., were burned on the 1st inst. Loss $100,000; Fully insured.

The iron ship Philosopher, which sailed from Calcutta for Boston on the 1st of September with $200,000, foundered when five days out.

Frank M. Fletcher, of St. Paul, committed suicide on Wednesday morning. Anxiety over money affairs is thought to have been the cause.

The Hyde Park bank, of Scranton, Pa., has made an assignment Assets claimed, $100,000. Hanford, the late cashier is in default about $20,000.

The Reading cotton factory, at Reading, Pa., employing 270 hands, closed on Wednesday on account of the operatives having struck for higher wages.

It is proposed to cut a ship canal across the peninsula of Florida to facilitate communication by water between the Atlantic coast and the Gulf states.

Charles F. McDonald, superintendent of the United States money order system, is in Berlin, Prussia, for the purpose of negotiating a new postal treaty.

A commission representing the state of New York and Canada is trying to devise a plan to prevent the destruction of the natural scenery at Niagara falls.

The Illinois Central Railroad company, which recently purchased in England 5,000 tons of steel rails for its New Orleans division has ordered 5,000 tons more.

Five of the largest stores in Bolton, Texas, were burned last Saturday and two others were pulled down to stop the progress of the fire. Loss, $100,000.

A new opera called "Sleepy Hollow, or the Headless Horseman" and founded on Washington Irving's delightful story, has just been brought out in New York.

The moulders at the Pittsburgh, Pa., locomotive works struck on Tuesday for an advance of wages and a proviso that no price work shall be done at the works.

The widow Oliver, who made herself notorious by her breach of promise suit against Simon Cameron, is now in the poorhouse of the District of Columbia.

The grading on the St. Paul, Minneapolis and Manitoba railroad from Fisher's Landing, Minn., to Grand Forks, Dakota, is finished and track laying commenced.

An English firm has brought out a new kind of dinner plate, made of wrought iron stamped into shape and covered on both sides with a vitreous enamel or porcelain.

The industrial school for boys at Waukesha, Wis., is afflicted with an epidemic of typhoid fever, which is thought to arise from bad water caused by defective sewerage.

The Kansas City *Price Current* estimates the value of the wheat and corn crops of Kansas this year at about $36,000.000, about a million and a half less than last year.

During the past three years 132 American railroads, covering nearly seventeen thousand miles, and representing an invested capital of $728,453,000, have been sold under foreclosure.

A Bangor, Me., farmer who found the grains taken from the heads of his wheat shot a yellow-bird by way of experiment, and found in its crop three hundred and fifty weavils and but three grains of wheat.

A fire at Keokuk last Sunday destroyed the St. Louis, Keokuk and Northern railroad round-house. Four locomotives were badly damaged. Total loss, $30,000; insured. It is believed to have been incendiary.

One hundred English farmers arrived at Montreal last week, on their way to the Little Saskatchewan, where they propose to locate. They bring capital to the amount of $50,000. Among the party are sons of English noblemen.

The Winnipeg customs duties during September were $17,000, against $10,000 in September, 1878. Value of goods exported, $84,000, against $113,000. The main cause of difference is the present facilities of earlier shipment by railway.

The Western Union Telegraph company has reduced to $2 to all points where it has been over $2 for ten words, beginning on the first of November. All offices of the company will be made half rate offices. Only the principal ones are now half rate.

Prof. Wise, with one companion, ascended in a balloon from St. Louis, last Sunday, and has not been heard from since. There is a rumor that the balloon was seen going toward lake Michigan, and it is feared that the occupants have been drowned in the lake.

The Caledonia, Mississippi and Western narrow gauge road, which is being constructed as a feeder to the Chicago, Dubuque and Minnesota line in southern Minnesota, is being pushed forward rapidly. The track is laid nearly to Spring Grove, and six grain elevators will be built along the line between Caledonia and Houston this fall.

A copper belt some two miles long and from 200 to 400 feet wide, has been discovered about the middle of the southern part of Maine, directly on the coast. Some 20 miles to the northward of the copper belt, silver has been found in flakes, masses and filaments. A shaft has been sunk some hundred feet deep, and it is reported that the ore increases in richness with the depth.

At about half past one o'clock last Friday morning, a fire broke out in Deadwood, Dakota, and spread with such rapidity that the entire city was reduced to ashes, and two thousand people were left homeless. The people showed wonderful spirit. Friday morning the city was in ruins. Within five hours after the breaking out of the fire, the first steps were taken toward rebuilding. Before Saturday night over two hundred temporary buildings were erected, contracts were closed for the erection of several fine brick blocks, and business of all kinds was being carried on. The rebuilding of the city with handsome and substantial buildings is already under way, and in six months the site of the ruined town will be occupied by a new and improved Deadwood.

XUM

The Great Saving by Mutual Insurance.

[From Chicago Tribune, September 19, 1879.]

There is no question more important to property owners than that of insurance. Prudence and safety require that they have it in some manner, else the earnings of a lifetime may be swept away in an hour.

In the western states, insurance heretofore has been done mostly on the stock plan, by paying a cash premium at rates more dependent upon the competition of insurance companies and their agents for business, then upon the degree of the hazard assumed.

Often large conflagrations have bankrupted the companies, leaving no indemnity for the money paid. Neither have the western property owners yet had a proper opportunity to procure insurance indemnity at anything near its cost price; for it is a well known fact in insurance circles, that the profits from the business have, late years, been almost entirely from the western states. To prove this, we take the statements of nine western states, showing the business done during the year 1878, viz:

	Premiums Rec'd.	Losses Paid.
California	$3,661,475	$1,099,879
Illinois	4,081,684	1,466,684
Iowa	1,455,029	547,304
Kansas	367,310	72,118
Michigan	1,730,126	899,327
Minnesota	882,121	820,801
Missouri	1,978,451	716,856
Ohio	3,850,466	1,845,257
Wisconsin	1,360,076	881,192
Total	$19,366,738	$8,349,441

Here, then, was a tribute paid to eastern capitalists of over $11,000,000 in a single year by these nine western states.

Illinois, alone, has paid, during the last seven years $39,554,815, for fire insurance, and received back, for losses, only $14,113,315, making a clear outgo to the state of $25,441,500. Perhaps it will be said that the unparalleled "Chicago Fire" of 1871, and the lesser one in 1874, will show that the premiums have been more than returned. But it is not so, for the last report from the state auditor shows that during the last ten years $52,197,268 have been paid in premiums, and $46,093,539 have been paid back for losses. With liberal allowance for losses paid by companies that failed and made no statements, the balance will still be largely on the side of the premiums. The state of Michigan has paid for fire insurance, during the last ten years, the sum of $18,832,292, and received back for losses $10,392,962, leaving a balance of $8,438,330 to the companies.

With these facts before us, it is very natural to ask: "Will the west always continue to pay such enormous tribute for insurance, mostly to eastern and foreign companies, or seek protection in some other manner?" It has been claimed that the west has not had, heretofore, the capital to form insurance companies for its own protection from losses by fire. Admitting that to be the case, even now, is there not some way to accomplish the object, furnish sound indemnity, and still keep these millions at home? There is a very simple way to do this, which, it seems, every one can easily understand.

Suppose, for illustration, that those nine states that paid over $19,000,000 in cash last year for insurance, had put the money at the beginning of the year into the hands of trustees, to be paid out for losses as they happened; at the end of the year they would have had over $11,000,000 left, or, allowing $1,000,000 for expenses, a net of $10,000,000. This saving in the short term of ten years would be $100,000,000. Again, suppose that the premiums for five years be put up; the amount would be over $95,000,000 cash, forming a very respectable Mutual Insurance company, notwithstanding the sneers of stock companies. But why put up so much cash? Why not put up obligations in the form of premium notes, and keep the cash in hand until it is needed? This would be forming a Mutual Insurance company according to the statutes of Illinois, except the paying of twenty per cent. of the notes at the time of organization. No one can dispute that from the showing of the ratio of premiums to losses, a company thus formed would be perfectly sound, and as sure of success, in fact surer than any stock company with a like amount of capital; and at the same time produce a saving of at least one-half in the net cost of the insurance. All that is now needed, is that property owners should understand the way, and then do it. Mutual insurance is nothing new, nor untried. The oldest and strongest companies in the country are mutuals. The system has been so managed for the manufacturers in the New England states, that such risks as cotton and woolen mills, bleacheries, paper mills, machine shops and the like, are now insured at an average cost of about one-third of one per cent. per annum, or about one-fourth the rate charged by stock companies. But let us look near home for an illustration of the working of the two plans: According to the sworn statements of the American Insurance company, of Chicago, (a stock company that has paid fifty per cent. dividends yearly the past two years, on a capital of $200,000,) its premiums received in the state of Illinois alone, for the last three years, amounted to $667,873, while it paid back for loss only 183,152, leaving for expenses and profits the snug sum of $484,631. On the mutual plan, that business could have done with a saving of at least $400,000 to the assured. As against this, the 171 mutual companies in the state of Illinois had at risk, on December 31, 1878, $26,649,658, for carrying which, the total losses and expenses amounted to only $32,419, or about one-eighth of one per cent. premium for the amount insured. Stock companies usually charge one half of one per cent., on the same class of business, or four times the rate of mutual insurance. The 47 Mutuals in the state of Michigan, during the year 1878, covered $112,662,699 insurance, and the cost to the insured was only about eighteen cents on the hundred dollars.

Again. The Miller' National Insurance Company, of Chicago, insuring only flour mills, a most dangerous class of hazards, has done business three and a half years, at a cost to its members of about one-half of what they were paying stock companies, and at the same time furnished better and safer insurance, because all its risks are isolated from each other; and thereby the company is free from "great conflagrations." It does its business on the premium note plan, taking notes for five annual premiums, and calling assessments as needed.

In the state of Ohio, the reports have shown, for many years, that the cost of insurance, on the mutual plan, has been only about one-fourth of that on the stock plan.

The question now arises, why is mutual insurance so much cheaper than the stock insurance? The answer is, that mutual companies save largely in three items, viz., expenses, losses and dividends, and what is thus saved is never drawn from the pockets of the assured. The expenses of the stock companies the past two years, as shown by their sworn statements, have averaged over forty per cent of the amount of premiums received. Mutual companies conduct their business for less than one fourth of that amount, and thereby save thirty per cent of the cost to the assured, in that item.

In the matter of losses, the saving is apparent in the fact that losses and expenses together, in mutual companies, cost the assured only about one fourth the rates of stock companies, the mutuals losing less than one-half that stock companies do on the like amount of business. This is accomplished by more care and discrimination in the selection of risks; the mutuals working by paid inspectors, while the stock companies obtain their business through agents working for commissions; the one plan operates for safety, the other is the reverse.

The third item of saving by Mutuals—that of dividends—is simply this: The dividends paid during the past ten years by the Stock Fire Insurance companies, doing business in the state of New York, have amounted to $57,199,050. On the plan of mutual insurance, that vast sum of money would never have left the pockets of the assured. By the foregoing, the argument is all on the side of mutual insurance.

The statements herein made are taken from official reports, and cannot be gainsaid. The property owners in the western states, only need to know these facts, in order to incite them to such action as will protect them from the present high cost of indemnity. The only need is organization and an intelligent and honest management, to secure to them the benefits within their reach. A mutual company is *within the control of the assured*; if mismanagement or dishonesty develop, the members have the remedy in their power; but when insured in a stock company, they have to *pay their money* and then take such treatment as may be given them, without recourse.

A company is now being organized to inaugurate the system of mutual insurance in the west: It is called THE WESTERN MANUFACTURERS' MUTUAL INSURANCE COMPANY, located at Chicago, the postal center of the west, but designed to meet the wants of the country.

It is organized by men that give it character, and the confidence of the public; and its already large list of membership embraces the names of the wealthiest and most prominent business men, firms, and corporations.

It is looked upon by its organizers and friends as the beginning of a new era in the business for them; and by its charter and by-laws, and the plan of operations adopted, its success is already assured. It will be managed by a board of twenty-five directors, selected from the different western states, giving each state or section an active voice in its affairs; and by this plan has already gained the patronage and favor of the best men in these sections.

Its success will lead to the organization of more companies on the same plan, so that the full benefits of the system will be obtained eventually.

Perhaps the best recommendation it has yet received, is the hostility of the stock companies and their agents, already strongly manifested. They see the ultimate results arising from its organization, and are unwilling to relinquish the rich harvests heretofore reaped from their western business.

Red snow, which is usually found only in Arctic latitudes, is to be seen this year on a lofty summit near Mount Stamford, in the Sierra Nevada range. For several acres the vast drifts are a beautiful pinkish tint to the depth of three or four inches. One explanation of it is that millions of minute organism cover the surface of the snow.

The War of the Telephones.

One of the most interesting patent litigations ever witnessed in this country is now imminent, growing out of the conflicting claims of rival inventors and patentees to the ownership of the telephone. Already nearly a hundred patents embodying supposed improvements in telephones have been issued, and more than a dozen interference suits are now pending before the Patent Office, brought in the names of as many patentees.

The general public knows only of the business rivalry between the Bell Telephone company, on the one hand, and the Western Union company, owning the Edison patents, on the other; but before the courts and the patent office the controversy takes a character entirely different. The merits of the case are very difficult to reach, and seem not to be fully understood even by experts in electricity or patent law. So many fine points in electrical science and in patent law, the most evasive and crooked of all branches of jurisprudence, enter into the matter that one becomes involved from the outset in a labyrinth of technicalities so dense that a just and intelligible solution seems to be an impossibility. The interference cases are set for a hearing some time next February, and the time meanwhile is being taken advantage of by the counsel to take testimony bearing upon the case.

Stripped of side issues, the immediate controversy appears to be narrowed down to the question of priority in the application of the principle of the undulatory current to the transmission of spoken words. Several years before the issuance of the first American telephonic patent, a German named Reis experimented in telephones, and is said to have succeeded in transmitting musical tones and vowel sounds by wire. Reis published an account of his experiments, with plans, an examination of which in the light of to-day makes one marvel that success should have eluded him. He made use of the same diaphragm which forms a part of all successful telephonic systems.

In July of 1875, Elisha Gray, of Chicago, obtained a patent upon a system of transmitting musical sounds, which it was thought at the time would form the basis of a system of multiplex telegraphy. Each note in the scale was to be made the medium of communication between different points. The principle is said to be theoretically perfect. Gray's patent was reissued on the 28th of January, 1879, and forms the foundation of the counter claim of the Western Union against the Bell Telephone company.

Prof. Bell's patent, the application for which was filed on the 14th of February, 1876, is based upon the employment of undulatory currents of electricity. The electrical current is never absolutely broken, but effects are produced by a variation in the strength of the current put upon the wire. This principle is a necessary part of every successful telephonic system, and by its means every variation in the volume of the human voice may be made to produce corresponding variations in the magnetic effects transmitted from point to point by telephone. Prof. Bell made no claim to the discovery of the undulatory current principle, but merely to its application in the manner set forth in his application. The claim of the Western Union is that the principle of the undulatory current was covered in the Gray patent. The settlement of this question will probably be only the first in the contest, however, which involves many other points.

Timber Rafts of the Black Forest.

The Bauer is primarily and by nature a woodman, and a very large proportion of the Black Forest people, who number about 300,000, are employed in the cutting and transporting, by road and water, of this chief product of their land.

Formerly all the timber was floated down the various streams into the Rhine. Very much of it is now conveyed by road and railway; but fortunately for lovers of the picturesque the old method is not wholly out of use, and rafting—*Holz-Flosserei*, as it is called—still forms for the stranger one of the most attractive features of Black Forest life.

The pines having been sawn off a little above the roots, are slid down the mountain or hill side where they have grown into the never-failing stream, which flows rapidly, over bowlders and amid rapids, through the valley. Here they are pierced at each end, and tied together with willow roots, in rows of from four to ten, according to the width of the stream. To this roughly constructed raft a similar one is joined, also tied with willow roots. To this another and another are added, until, perhaps as many as thirty lengths of tall pine-trees have been joined. To the foremost a sort of rough bow—a hollowed tree trunk—is usually fixed, and the last section of the raft is fitted with a rudder formed of a stripling pine.

The frail, extraordinary-looking craft is now launched on its rapid voyage. A man stands at the bow to steady it, the water flying up between the trees and drenching him at every yard. Another is at the helm. All along the raft, men furnished with poles or oars move rapidly from section to section, guiding here, restraining there, and at times having to use all their strength to cling on, liable to be swamped at every moment, as the raft rushes madly along with the impetuous torrent, dashing over rapids, and through narrows, and over bowlders, twisting and curving as it follows the intricate windings of the stream, "like a thing of life," not precisely after the fashion in which we ordinarily apply the term, but rather in the form of a huge, black, wriggling serpent, which seems to swim rather through than upon the surface of the stream, sending a rolling wave before it, which surges up and through the tree trunks in a thousand hissing eddies.

As may well be believed, the navigation of these rafts requires no little skill, care, and knowledge of the locality; and the extreme rapidity with which they are carried over the seething water seems to the uninitiated on-looker simply a mad career towards destruction. As a matter of fact, however, the streams are so shallow that little real danger exists.

Where the narrow mountain stream flows out into the scarcely less rapid river the rafts are widened and joined to others, until in time, when the broad and stately Rhine is reached, they are built up into those floating villages which may so often be observed upon the river, some of them, it is said, 700 feet long.

These constructions are very peculiar. They are formed of several layers of trees placed one on another, and planked over with rough deal so as to form a deck. Upon this are erected various small huts and cabins; for the Rhine raft carries often a population of not less than three or four hundred persons, the boatmen being accompanied by their wives and families, while cows, fowls and pigs are carried for the use of the crew; and we are assured that the domestic economy of an East Indiaman or an English man-of-war could hardly be more complete. A well-supplied boiler is at work night and day in the kitchen; the dinner hour is announced by a basket stuck on a pole, at which signal the pilot gives the word of command, and the men run from all quarters to receive their rations; while the consumption of victuals during the voyage is stated to be almost incredible, it having been calculated that, from the time of the construction of the raft until it is sold, no less than 45,000 pounds of bread, 30,000 pounds of meat, 15,000 pounds of butter, 10,000 pounds of cheese, 500 tuns of beer, 8 butts of wine, and other provisions in proportion are disposed of.

The rafts are navigated to Holland, where they are sold, producing from £20,000 to £30,000 each. The rafts are very frequently the property of a company known as the Schiffer-Gesselschaft, which dates from the sixteenth century, and which unites a vast number of small forest proprietors. This company, together with the government and the Prince of Furstenberg, own the greater part of the Black Forest. The timber exported from the forests of the Schiffer-Gesellschaft alone is estimated at over £100,000 pounds yearly, and altogether Holland is a consumer of Black Forest timber to the amount of £170,000 per annum.

The Baker's Art.

[Translated from "Le Meunier."]

Bread, as we are all aware, is obtained by baking dough made from flour and water. In most cases wheaten flour is employed, but other cereals, as for instance corn or rye, furnish flour suitable for baking purposes. The theory of the manufacture of bread has been thoroughly explained of recent years, and practical men have turned their attention to introducing mechanical power into this industry to replace the manual labor which has hitherto been employed. Although the results obtained by the use of mechanical means are still questioned by many, and the machines have not attained the popularity counted upon by their inventors, the problem will no doubt be satisfactorily solved ere long.

In its ordinary state wheaten flour contains a proportion of water varying from 12 per cent to 18 per cent, according to the kind of wheat and the nature of the crop. This proportion can be regulated in the flour by the process of drying, and the quantity of water need never vary, no matter what the nature of the wheat has been from which the flour has been obtained. This process is an important advance in the art of milling, and one in which many improvements have been made. Besides water, which we have just mentioned, flour contains:—

	Per cent
1. Nitrogenous matter insoluble in water of which gluten is the type	12 to 13
2. Nitrogenous matter soluble in water of which albumen is the type	2
3. Non-nitrogenous matter insoluble (Starch 60 per cent, fatty matter 1 per cent, and a small percentage of cellulose)	61 to 62
4. Non-nitrogenous matter soluble (Dextrine and a little sugar)	8
5. Mineral substances (Phosphate of magnesia and of chalk, salts of potash, of soda, and of silica)	1 to 2
Total (exclusive of water)	81 to 87

If we wish to obtain the greatest amount of nourishment from all the elements of the flour, they must be rendered soluble, and the process of baking, by acting principally on the gluten and starch, has precisely the preparation of this dissolution in view. The grains of starch are swollen by the absorption of the flour in the water, and the baking causes them to burst by breaking the lining of the cells in which they are confined. The process of fermentation stretches the gluten to allow of its being more easily attacked by the gastric juices of the stomach. Thus the manufacture of bread comprises three distinct operations:—

1. The absorption resulting from the kneading.

2. The fermentation which renders the dough less dense by increasing the surface presented by the gluten to the gastric juices of the stomach.

3. The baking.

The richness of the flour in gluten renders the dough more plastic, and the bread is consequently more nourishing. Several kinds of apparatus have been invented with the view of determining this richness, among which may be mentioned Boland's "Aleurometer," and Robine's "Appreciateur." The richness of flour in nitrogenous matter varies according to the kind of wheat from which it has been made, as may be seen from the following table, which we extract from a work published by Mr. B. Corenwinder, director of the Society of Science and Agriculture at Lille:

Origin and Denomination of the Wheat	Composition of the Flour. Water.	Gluten and Albuminoids	Starch and Salts.	Nitrogen in every 100 parts of Dry Flour.
Galland (French).	13.15	6.81	80.04	1.14
Blue Wheat (French).	12.61	6.28	81,11	1.16
Chilian	13.00	7.56	79.44	1.39
French (2d quality),	12.04	7.75	80.21	1.41
Armentieres.	13.20	8.03	78.77	1.48
Californian.	11.00	8.23	80.77	1.48
Oregon.	13.75	8.17	78.08	1.51
New Zealand.	11.85	8.98	79.17	1.63
American Winter.	12.00	8.52	79.48	1.70
White Australian.	14.00	11.18	74.82	2.08

The Galland wheat furnishes a larger proportion of flour than the other wheats, which may be attributed to the exceptionally large size of the grain; unfortunately the quality of the flour leaves much to be desired in some respects—it is wanting in whitness, poor in nitrogenous matter, the dough does not knead well, and it produces a bread without cohesion.

The blue wheat, so called from the bluish tint of the husk, is sometimes known by the name of Australian wheat, although, strictly speaking, the term is incorrectly applied. The grain is pretty large, and of a brownish color; the flour is short, as it does not contain a sufficient quantity of gluten.

The Chilian wheat has a white grain, well formed, regular and moderately large. It produces a flour very similar to the second quality French wheat in respect to the richness in nitrogen, and it is classed in the second rank among the products of America. The different varieties of wheat from Armentieres, Estraives, Bergnes, Meraille, and other localities of the north of France, are, in general, more highly prized than the Californian wheats.

The Oregon wheat is of superior quality; the grain is white, clear, and regular, and it gives a large proportion of superior flour. It takes its place in the first rank among the soft wheats.

The New Zealand wheat is pretty regular, and produces a flour rich in nitrogen.

The American winter wheat grown in Ohio and Michigan gives a very fair quality of flour. The grain is of a brownish color, small, translucent, rough in appearance, and rich in nitrogenous matter.

The Australian wheat is of a superior class, and maintains its reputation both with regard to its suitability for sowing or for consumption. Its grain is clear, regular, and of moderate size. The proportion of flour obtained is large, the quality is good, and it is richer in nitrogenous matter than any other kind of wheat. In short, the fertile soil of Australia produces the finest wheat in the world.

The best kinds of flour, and those which are best liked by bakers, are of a dull white color, slightly approaching to yellow, unctuous to the touch, do not contain a single particle of bran, and possess an agreeable and characteristic odor. When mixed with half their weight of water, and thoroughly kneaded, they produce a homogeneous dough (containing neither lumps nor foreign bodies), which may be drawn out in thin sheets, possessing a certain degree of elasticity.

If flour is submitted for a certain time to a temperature of 100° C. (212 F.) it loses a large portion of its hygroscopic water, generally from 12 to 18 per cent., according to the manner of, and time employed in, the drying; and it is on this property that the various means employed for the preservation of flour are based—processes which have long been the object of important improvements at the hands of C. Touallion. When again exposed to the action of the atmosphere, the flour re-absorbs the water which it previously lost. One of the chief causes of change in flour is the excess of humidity contained therein; therefore millers cannot guard too much against the inconvenience arising from excessive or irregular damping of the wheat. A slight damping is sometimes necessary, but if the flour is destined to be kept for any lengthened period it must be dried. Flour, when too moist, agglomerates, and sometimes becomes quite hard. Fermentation is hereby engendered, and the gluten undergoes certain changes which render the flour unsuitable for producing a white, light bread, agreeable to the taste. An excess of humidity also favor the development of certain cryptogams (fungus), which impart a disagreeable odor to the flour and give it unhealthy or even poisonous properties.—*The Miller.*

A Nation Without Iron.

Mr. A. Woeikof, in a narrative of his travels in Yucatan and the southeastern states of Mexico, published in Peterman's *Mettheilungen*, introduces us to a so-called "civilized" people, who are practically unacquainted with the uses of iron. Writing of the northern portion of the State of Chiapas, he says that the inhabitants employ iron only in the shape of axes and 5atchets, which are imported from the United States. For the distance of 100 kilometers round about Palenque, not one blacksmith is to be found. Not a single nail is to be seen in their houses; everything is held together with cords or with vines. Even in the preparation of their principal article of food,—tortillas—the apparatus they employ is equally primitive, though in this respect they follow the custom which is universal throughout all Mexico and Central America. The grains of maize are crushed between two stones, one of which, the nether one, is rather large, with a sloping upper surface. A woman kneels by this stone and strews upon it some grains of maize, over which she works to and fro another stone of cylindrical form, so grinding the maize. The coarse meal so obtained is baked into flat tortilla-cakes in the ashes. This is exactly the mode of preparing meal in vogue in Central and South Africa; the African negroes, however, show a higher grade of culture, inasmuch as they understand the working of iron.

Somebody has contrived a machine for testing the strength of fabrics like that of building materials, by subjecting them to a measured strain and determining the point of breakage.

Industrial.

Silk manufacturing is soon to commence in Philadelphia.

For the first time in five years there is an actual scarcity of American leather in the hands of English factors.

New Orleans letters state that the coming crop of sugar and molasses will fall not far short of last year's productin.

Within the last five years the acreage of cereals in the United States has increased from 74,000,000 to 95,000,000.

The cotton manufacturers of Rouen, France, complain that they cannot find a market for one-quarter of their productions.

The recently-arrived Sheffield, England, operatives are making fine razors at Bridgeport, Conn. Razor-making has never been successful in this country before.

There are sixty iron steamers being built or fitted out on the Clyde. Forty-eight are being built under London Lloyds and twelve under the Liverpool Lloyds' book.

The Lowell Carpet Company is building its own Brussells looms for a new mill. This has never before been done in this country, all such machinery having been imported.

There are indications that the consumption of woolen fabrics will be on an immense scale this fall and ensuing winter, and the mills will have all they can do to supply the demand.

A considerable number of English ironworkers, rolling mill hands and machinists have been inquiring for situations at Pittsburgh during the past couple of weeks. They are fresh arrivals.

It is estimated that the various cotton manufactories in and around Agusta, Ga., use $1,500,000 worth of raw cotton per annum. The annual sales from their product amount to about $2,600,000.

The cotton crop this year will be 500,000 bales more than ever before, the tobacco crop 12,000,000 pounds more than ever before, and the sugar crop 200,000 hogsheads more than ever before.

The Belgian National Exhibition to be held in 1880 is proposed to be made an international affair, and there seems little doubt that the department devoted to agricultural machinery will, at all events, be thrown open to all nations.

The importation of crockery has decreased about one-half in the last ten years. English manufacturers have concluded that the American market is closing to them, and English capital is being employed in the establishment of new factories in this country.

An Industrial Exhibition is proposed to be held in Buenos Ayres next year, the exhibits to include industrial, agricultural and other machinery suitable for the requirements of South America. All goods exhibited will be admitted into the country free of customs duties.

The Canadian government has offered a subsidy of $50,000 to a direct line of steamers between Canada and Rio de Janeiro, and is favorably disposed to the establishment of a direct trade, receiving coffee and sugar from Brazil and sending thither Canadian flour.

The Lewiston, Me., cotton mills are running 300,000 spindles, employ 8,500 hands, consume 22,000,000 pounds of cotton and produce 55,000,000 yards of cloth annually, and circulated last year $3,000,000 in town. Corporation stocks show an aggregate rise in one year of $1,500,000.

The inroads which American competition has made on British trade is shown by a statement in a recent cablegram that within a fortnight a large firm of agents in Lancashire had taken more orders for American cloth for India than they had received in the same period in connection with all the English firms which they represent.

The industrial exhibition at Sydney, Australia, is said to be a great success. Great Britain has 800 industrial exhibits and 513 of fine arts. Germany has 691 entries and Austria 170. France has 350 industrial exhibits and 168 of fine arts. Belgium has 236 industrial exhibits and 50 of paintings. America has 150 industrial exhibits.

Over one hundred locomotives are in course of construction at the Baldwin Locomotive works, Paterson, N. J., including orders from South America and Australia, and 6,000 mechanics are employed in the shops. "Locomotive 4,707" was finished a few days ago, showing an average of five locomotives constructed weekly since the works were established, thirty-five years ago.

The vast water power of Augusta, Ga., is being gradually utilized, and already manufactories of various descriptions line the banks of the levees of the canal. There are now four cotton factories in operation, with an aggregate capacity of over 40 000 spindles, and a fifth, the Summerville Mills, will soon be turning out checks, stripes and plaids. A large waste factory on the river bank does thriving business. A cotton gin manufactory has been established and is rapidly putting up gins, condensers and feeders. Three machine shops make every description of carpenters' work.

Iron ship-building makes steady progress among the Delaware ship-yards, encouraged largely by the increasing favor bestowed upon iron hulls for the coastwise trade. The fame of these establishments may almost be said to rival that of the iron ship-builders of the Clyde. The only favor these Delaware builders ask of the national government is that the building of iron vessels for the naval and revenue service may be given out by contract, instead of being done at the various naval stations. Better and cheaper work can thus be obtained, and the long standing struggle of naval stations for precedence and patronage will be quietly and easily settled. Some important progress has been made in that direction, a large amount of government work of that kind having been done by contract at private establishments during and since the war. In this way the United States government, following the example set by the English authorities, has, without the adoption of the subsidy system, given very substantial aid to American iron shipbuilding.

Experiments With Wheat.

The report of experiments by S. M. Tracy, professor of economic botany at the Agricultural College of the University of Missouri, shows that with 44 varieties of winter wheat, the Red May ripened June 9, and yielded 32.46 bushels per acre, weighing 62 pounds per measured bushel; Mediterranean, smooth, ripened June 12, yielded 29.42 bushels, and weighed 63 pounds; Fultz ripened June 12, yielded 35.90 bushels, and weighed 63½ pounds; Diehl ripened June 12, yielded 39.60 bushels, weighing 61 pounds; Treadwell ripened June 20, yielded 52.38 bushels, weighing 61 pounds.

In relation to synonyms, Prof. Tracy says: Red Lancaster is known as Red Sea; Early Michigan as English Bull and Missouri Swamp; Red May, as Early May, Gold Drop, Tennessee May, Orange Red May, Yellow Lammas; Zimmermann, as Democrat, Alabama May, Walker, Wilson, Late May, Lime, Golden Chaff; Clawson, as Genesee, Seneca; Mediterranean (smooth), as Sea Island.

Although every variety, with one exception, gave a larger yield in 1879 than in 1878, the most marked increase is shown in the Russian kinds, which gave an average yield of 31.29 bushels per acre in 1879 against 18.22 bushels in 1878. They all seem very hardy, and stand up well, but the proportion of straw is greater than in the American varieties. The Oregon varieties have all been discarded excepting the Oregon club, which yielded less than the average for the two years.

It was found that from the beginning of harvest to June 21, in 1878, and to June 20 in 1879, there is but little difference in the yield, but that after those dates, especially in 1878, the yield decreases. The actual decrease was greater than is indicated by the table, as eighteen varieties which yielded less than fifteen bushels to the acre, and are not included in the table, all ripened June 29, or later, in 1878, and June 21, or later, in 1879. With a selection from the varieties ripening before June 21, the time of harvest extends over thirteen days, which in most cases is sufficient time to enable the cultivator to harvest his crop when it is in just the right stage. Prof. Tracy thinks that by a proper selection of seed during a series of years it will doubtless be possible to extend somewhat the time of harvest.

Several of the varieties which succeeded best in 1878, and a few of the varieties received last fall were sown on the college farm. With these crops, Mr. Maddox, farm superintendent, reports the following results: "Clawson, two fields yield 23 and 26½ bushels per acre; Silver Chaff 20 bushels; Fultz, two fields, 16 and 25 bushels. These crops were all raised on dry white oak ridges which have been in cultivation for many years, and have received almost no manure. On one field where Zimmerman was almost a failure in 1878, Sanford and Smooth Mediterranean were grown and yielded 15 bushels per acre. Mold's White and Mold's Red gave only 11 bushels, and Polish 15 bushels to the acre."—*Prairie Farmer.*

Scientific Notes.

The German government has dispatched two distinguished geographers, Drs. Graefe and Gasser, on a scientific mission to Africa.

Eleven new metals have been discovered within the last two years which have received the following names:—davium, mosandrium, phillipium, ytterbium, decipium, neptunium, lavæsium, norwegium, uralium, scandium and thaumasite.

Prof. Klinkerfues, the director of the observatory at Gottingen, has patented a new telegraphic invention by which it is said to be possible to send as many as eight messanges simultaneously along the same wire. A portion of the invention is an apparatus which simultaneously writes down all the messages as they arrive at the station to which they are addressed.

A new type writer consists in the combination, with a finger lever and platen or roller for the paper, of a type bar, having its pivotal point and its point of connection for the connecting rod which connects the type bar with the finger lever arranged so that when the points are brought in a direct line with each other the type will clear the roller at a convenient distance from it.

St. Helena seems to afford a somewhat striking example of the effects of forest denudation upon climate. It is stated that the extirpation of indigenous trees, shortly after the first colonization of the island in 1673, was followed by a succession of severe and destructive droughts, but that since the forest lands were replanted the island has ceased to suffer from them to anything like the same extent.

A gentleman read a paper before the recent meeting of the Institution of Mechanical Engineers at Glasgow, in which he claimed that the rubber tires used on the traction engines of India were of great service in reducing the cost of the ordinary engine repairs, and in giving uniformity of adhesion, without damaging the surface of the roads. The cost of the tires did not exceed 1½d. per mile. The manager of the Glasgow tramways stated that the engines used by him were provided with rubber tires, without which they would be unable to secure sufficient adhesion to enable them to do their work.

THE CELEBRATED

Becker Wheat Brush

Has recently been ordered by the following parties:

Thomas McGee, Perry, Ill.; S. W. Hickox, Springfield, Ill.; Ely & Stetman, Manheim, Pa.; J. M. Brandt, Mt. Joy, Pa.; Jesse Witten, Upton, Pa.; Thos. B. Bryson, Mechanicsburg, Pa.; W. H. Elder, Turin, Ga.; H. Merrill, Newman, Ga.; J. H. Curtis, Oregon, Mo.; East Forest Mill Co., Forest City, Mo.; C. C. Busby, Jerseyville, Ill.; D. O. Johnson, Perry, Ill.; Thos. Williams, Pontiac, Ill.; Grant & Trater, Mooresville, Ind.; Wyson, Kline & Co., Muncie, Ind.; Jas. N. Brooks, La Porte, Ind.; Nordyke & Marmon Co., Indianapolis, Ind.; Simpson & Galt, Cincinnati; Straub Mill Co., Cincinnati; E P. Allis & Co., Milwaukee, Wis.; J. F. Ellsworth, Williamsburg, Pa.; Thos. Henderson, Spruce Creek, Pa.; Henry & Co., Huntingdon, Pa.; Shenk & Sowers, Ovid, Mich.; Jas. Marriott & Bro., Long Grove, Ky.; Bramble & Miner, Yankton, Dakota; Jas. M. Lee, Chattanooga, Tenn.; F. W. Jaquin, Morris Plains, N. J.; Hugh Bartley, German Valley, N. J.; Jas. Conrad, Castroville, Texas; Sills Bros., Myersburg, Canada.

C. C. TAYLOR,

of Appleton, Wis., inventor of the "Worlds Turbine" wishes the address of every miller and manufacturer in the United States that is using water power.

PURIFIERS FOR $110.

The Improved French Middlings Purifier, with underblast, to clean the middlings, and suction fan to carry off the dust. In use in twenty different states on all kinds of middlings. Cloth three feet wide by five feet three inches long. Send for descriptive circular with illustrations.

C. G. ROLLINS,
Minneapolis, Minn.

A MILL TO RENT

Or a miller wanted. We have a grist mill on the Musquito creek, at Niles, Ohio, with two run flouring burrs, one corn stone, one middling stone, one Wolf's flour packer, purifying bolts, smut machine, and other machinery found in a modern mill, all in first class order and run by water power.

We will rent the mill or hire a good miller to run it. For further particulars call and see or address us at Niles, Ohio.

M. J. SLOAN.
9-12 4t. LYDIA F. BALDWIN,
Executors of Geo. S. Baldwin.

The *American Miller* for April contains an official list of members of the Millers' National Association. On examining the list we find that it numbers over 700 firms, representing over 3,000 run of buhrs. We also find that over one-fourth of them, representing nearly 1,500 run of buhrs, are purchasers of our Diamond Mill Stone Dressers. They expect large additions to their membership—we also expect large additions to our list of purchasers, both from outside and inside of the association. Why? Because we have the best buhr dressers in the market.

GRISCOM & Co., Pottsville, Pa.

Manufacturers and owners of patents of McFeely's improved buhr dressers.

For the best and finest selection of Diamonds for Dressing Mill Stones, address,

THOS. McFEELY,
Union City, Ind.

STOP! STOP!! STOP!!!

PURCHASING

Middlings Purifiers

Until you send your address to Andrew Hunter, who will explain the reason why and show you how to save from $50 to $300 on the purchase of each machine. "A dollar saved is a dollar earned." Members and those who are not members of the Millers' National Association will hereafter reap the benefit of the decision. Said decision prompted Hunter to reconstruct and simplify his machine, placing it outside of all possibility of infringement from reissues of old patents or any invention in use. Hunter has had the good fortune in simplifying his machine to enable him to compete in price with the poorest machine on the market. Hunter's purifiers are fully protected by his own patents, he having spent the past 18 years experimenting on machines for separating by specific gravity. He owns now over 15 patents, which cover fully all the principles used in his machines. Consequently there is no necessity of purchasing a license, or bolstering up with the aid of old patents or reissues. He guarantees better work and greater capacity than any machine in the world.

ANDREW HUNTER,
471 West Washington St.,
Chicago, Ill.

Foreign News.

Belgian iron manufacturers report a general improvement in their trade.

Ex-Empress Eugenie is going to visit Scotland on Queen Victoria's invitation.

The duties on needles and cutlery imported into France are to be increased 24 per cent.

A fight occurred near Castle Bar, Ireland, on the 1st inst., in consequence of rent troubles.

It is expected that Germany will participate in the proposed international money conference.

Japan is gradually abolishing export duties. A proportionate increase of import duties is expected.

The government of Guatemala has raised import duties 25 per cent. The former rate was 70 per cent.

The iron ship builders of the Tees district, England, contemplate a reduction of wages which their men will very probably resist.

Eastern Siberia is menaced with famine. Grain is dearer than ever before, and the poor are suffering severely. The harvest was very bad.

In order to facilitate direct export of grain to England the Russian government has appropriated 5,000.000 roubles for improving the Esthonian harbor on the Baltic.

The *Golos* of St. Petersburg, says that 11,854 persons were incarcerated in the central prison in Moscow during the summer, 10,479 of whom were condemned to exile in Siberia.

Owing to unfavorable reports of the labor market in America, the North Wales Slate Quarry Men's Union have declined to give further pecuniary assistance to members desiring to emigrate.

The Brazilian government has presented to the legislature a project for establishing a general system of telegraphs, to spread all over the republic like a network, and to be placed in immediate communication with the public offices.

A new coin is being issued by the French mint— equal in value to the United States dollar. It is especially intended for circulation in Cochin China, where the five franc pieces, nominally equal to the dollar, have suffered depreciation in consequence of the fall in the value of silver.

By the commercial treaty between Austria-Hungary and Italy the Austria-Hungarian import duties have been reduced in eighteen cases in favor of Italy. The Austrian cabinet is now said to be considering the desirableness of bringing in a bill authorizing corresponding reductions in the general tariff.

According to the latest reports from silk-growing districts, the silk crop of France and Algeria is estimated at from one-fifth to one-fourth of an average yield. Italy's crop is only one-third of the average, and Spain and Portugal show a serious deficit. India and Japan also have a short crop, while China, on the other hand, will furnish fifteen per cent more than last year.

Germany is getting into a quarrel with Japan. A German steamer was recently authorized by the German envoy to the mikado to break the cholera blockade at Yokohama, in consequence of which Japan is changing the cholera regulations concerted between Japan and Christian powers. America sides with Japan, but England supports Germany.

A recent decree issued by the government of the island of Cyprus raises the import duty on the following articles: Machinery and agricultural implements, anchors and ship chains, boats, charcoal, common lumber, chalk, pitch, tar, rosin, tanning bark, ice, fresh fish, empty bags and barrels, books, bullion and specie. Provisionally, the import duties have also been increased on wheat, barley, oats, flour, chopped straw and all fodder, as well as cotton seed.

Three medical celebrities met together to consult at the sick-bed of Gen. X. After they go the general rings for his man-servant: "Well, Jacques, you showed those gentlemen out; what did they say?" "Ah, general, they seemed to differ with each other; the big fat one said they must have a little patience and at the autopsy—whatever that may be—they would find out what the matter was."

The English Grain Market.

LONDON, Sept. 30.—The *Mark Lane Express* says the condition of new grain has not improved to any appreciable extent. Threshing has made little progress, as most grain already secured is in an unfit state, and some weeks must elapse before offerings of new wheat will show any material increase. It is pretty generally admitted that the wheat crop the present year will be about thirty per cent. below the average. Home requirements between now and next harvest may be expected to absorb sixteen or seventeen million quarters of foreign produce. Neither mangels nor Swedes can be average crop, and the turnip crop generally presents a wretched appearance. Potatoes in many localities are not worth the expense of lifting. The oat fields in Scotland are still green, and night frosts have prevented barley from filling out, while cool, dry weather is urgently needed to check the speckled potato disease. From the south of Ireland rather favorable reports have been received as to the oat crop, which appears to have suffered less than any other cereal, both in the United Kingdom and on the continent. Supplies of home-grown wheat at country markets have again been exceedingly light, last week's deliveries at 150 principal towns showing a decrease of 47,000 quarters as compared with the corresponding week last year. The average price was 4d a quarter less than the preceding week, which is of much significance as regards the defective quality of offerings, when a strong upward turn in prices is taken into consideration. The samples shown at Mark Lane were likewise few and inferior, but with reserves of last year's crop at lowest ebb. Sales have been made readily at an advance of 2s a quarter on the week, white wheat realizing from 50 to 52s and red from 45 to 49s per quarter, the imports of foreign wheat into London, delivery made last Friday, showing only 36,720 quarters, and the week's trade has been marked by a degree of excitement which was not altogether expected. The most sanguine operator could scarcely have foreseen the extent and suddenness of the upward movement. The improvement has been steady on some days even to an extent which has allowed the same parcel of wheat to change hands, at respectable profits in each case; such activity has not been seen near Mark Lane since 1877. All descriptions of foreign wheat improved full two shillings per quarter, making a total advance of abcut seven shillings from the recent lowest point. The cause of the rise has been present for some weeks past, but the effect has been delayed till recently, as millers held back as long as there was a possibility of the home crop turning out more favorably than had been predicted. Such a possibility no longer exists, and the fact suddenly forced itself upon the minds of buyers, with the results recorded above. The amount of business has been exceptionally heavy, and the slight reaction which took place during the middle of the week has been more than recovered. Nearly all descriptions of cereal produce shared in the upward movement, maize to the extent of four shillings per quarter, barley and oats sixpence, and beans and peas one shilling. During the early part of the week the trade for wheat off the coast ruled very strong, and the advance was considerable. On Thursday a reaction ensued, which was brief, as the trade speedily recovered, and closed high at the end of the week at the highest point yet touched—say from two to three shillings per quarter advance upon the week. Maize participated in the movement, prices rising sixpence per quarter. There has been a very large business done in foreign wheat, principally California and red winter American, for both of which quotations indicate an advance of fully three shillings per quarter. Maize and barley are also in good request at sixpence advance. Sales of English wheat last week, 14,186 quarters, at 45s 5d, against 70,791 at 14s 5d, at the same time last year. Imports into the United Kingdom for week ending September 20th, 1,692,731 hundredweights of wheat, and 208,712 hundredweights of flour.

Mr. A. W. Stiffel, a Russian nihilist, is in Minnesota for the purpose of purchasing a large farm for a colony of his countrymen. His party consists of four couples, five unmarried men, and a widow with twelve children, and they propose to open a farm of about 10,000 acres somewhere in this state.

THE CALIFORNIA

Horizontal Brush Scourer and Finisher,

With or without riddle or shoe, is **Warranted** to be the **Best** and

MOST THOROUGH BRUSH IN THE MARKET.

We know whereof we affirm and mean just what we say.

Send for Circular. It will pay you.

M. DEAL & CO., Manufacturers, Bucyrus, Ohio.

GLORIOUS NEWS

FOR MILLERS.

MONOPOLISTS, BULLDOZERS, AND VENDERS OF WORTHLESS MACHINES

Who have long imposed on the milling public, must now give way to Hunter's latest improved purifier. The milling interests of the United States will not admit of exorbitant prices, nor will manufacturers be able to pay high-toned millwrights 35 per cent. for selling or recommending their machines. Hunter's new purifier retains all the superior qualities of the old, but it has been simplified to such an extent that he is enabled to reduce the price nearly one-half; furthermore, he is not compelled to take out a license or pay royalty, neither has his new machine anything in common with other purifiers. He has recently invented a device for cleaning the cloth, which proves far superior to any brush operated under the screen. This device renders it impossible for middlings to stick in the meshes of the cloth, or for adhesive particles to accumulate on the screen.

ANDREW HUNTER,
471 West Washington St.,
Chicago, Ill.

DUC'S

Improved Elevator Buckets.

BEST IN USE!

This is the only **Scientifically Constructed** bucket in the market. It is struck out from charcoal stamping iron. "No corners to catch." "No seams to burst." "No interior corners to clog up." It runs with great ease, and **half the power** of the old style bucket. Will outwear half a dozen of them.

Prices Reduced.

T. F. ROWLAND,
Sole Manufacturer.
Brooklyn, N. Y.

ROBINSON & CARY, Agents,
St. Paul, Minn.

WARRANTED!!

LYE & ZIMERLE'S IMPROVED ANTI-INCRUSTATION COMPOUND FOR STEAM BOILERS.

We guarantee this preparation to neutralize the fresh deposits of lime and other mineral, thus stopping new formations of scale, and to gradually bring out the old scale. We earnestly solicit all users of steam to give it a trial.

Prices reduced to 50 cents per gallon in barrels, half-barrels and quarter-barrels. Correspondence solicited and references furnished. Please give diameter and length of boiler, well or river water, and kind of mineral as near as possible. Address,

LYE & ZIMERLE, Delphos, Ohio.

ALLEN'S PATENT

"AUTOMATC GRAIN WEIGHER AND REGISTER."

A New and Useful Machine for Weighing Grain in the Rnnning Stream, and the Only Successful one Ever Invented.

One of these machines set over the hopper shows the miller the exact quantity of grain ground in an HOUR, a DAY, or a YEAR.

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They have as yet only been made in small sizes, to weigh from five to three hundred bushels an hour, but can be increased to any capacity required.

They are of small size, light and easily handled, and can be put in a very small space; a machine which will weigh and register three hundred bushels an hour occupying less than eighteen inches square.

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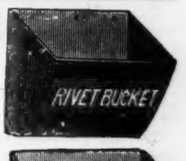
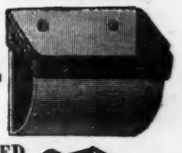


THE RIVET (Will) Bucket.

250,000 in Use.



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This saves 10 to 25 per cent. in the wear of the belt. Sample sent.

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Send for Lists and Prices of needed articles

What the Pyramids Were Built For.

The New York *Times* man finds fault with Mr. Richard Proctor's pyramid theory and offers the following as his own view of the matter:

This elaborate theory based on a small quantity of contradictory facts, is a curious illustration of the proneness of scientific persons to shut their eyes to what is obvious and to prefer what is far-fetched and improbable. The real purpose for which the great pyramid was built bears not the slightest resemblance to Mr. Proctor's little romance, and ought to be plain to every thoughtful observer. The pyramid is surrounded by soft sand of great depth, and was originally partially cased with polished stone, though, of course, a stair case existed at one of its corners. It was built to supply the Egyptian public with a means of sliding down hill in a country where snow never falls. The Egyptian who paid the requisite entrance-fee was allowed to ascend the pyramid by the stair case, and then to slide down the polished side, plunging pleasantly and harmlessly into the sand at the foot. No sleds or other apparatus were needed. The Egyptian simply sat down on the warm and comfortable granite, and slid down without any unpleasant friction. Doubtless, this was a fashionable amusement for both sexes and all ages, and the builders and lessees of the great pyramid sliding-rink must have made a good thing out of it.

The interior of the pyramid, as its plan proves, was a combined ice-house and beer-cellar. The ice-man had merely to dump his blocks of ice in the first passage, and they slid downward into the chamber intended for their reception. The second chamber was a vast beer-reservoir, kept cool by its proximity to the ice-chamber. Tubes led from it to the bar, which, of course, existed outside of the pyramid, and thus ice cold beer was supplied to the Egyptain public during the hottest weather, and, let us hope, at popular prices.

We have here a theory which is at once simple and probable, and which exactly coincides with the known facts as to the construction of the pyramid. The builders certainly deserved a great deal of credit in making the same structure serve for the purpose of sliding down hill and for the preservation of ice and beer in an equatorial climate. To overlook this obvious explanation of the object of the great pyramid, and to construct elaborate and untenable theories connecting it with astronomical and religious affairs, is what we might have expected of a scientific person. Alas! when will the day come when science and common sense shall be reconciled?

The Hand Shaking Bore.

Didst ever meet the handshaking bore? He called in the other day, happening first in the pressroom. Seeing him coming and knowing his penchant, the pressman prepared himself for the ordeal by slyly smearing his own hand with printers' ink. The visitor came on, all unconscious of his fate, reached out his mandible and got a pressure and impression at one and the same time. But ah, the artfulness of the fellow! He spoke not, he scowled not, he made no sign. He simply walked around the room and through the various rooms, and with engaging impartiality shook the hand of everyone, editor-in-chief, "local," the scissorsman, the foreman, the intelligent compositors, proof-readers, devil and all. Not one escaped. He then took his leave soberly and unostentatiously, like one retiring from a funeral service. And then there was a rush for wash basins.—*Boston Transcript.*

Eastern, Central and Western Texas.

Texas may be, for convenience' sake, divided into eastern, central, and western sections. The first, or timbered portion, has the Trinity river as a western boundary. This region exceeds the area of the state of New York. Central Texas may be defined as including all of the vast prairie lands from the Trinity to the Colorado, leaving beyond a territory larger than both of the former, and exceeding the size of any four ordinary states, as the western portion. The first named is the oldest in point of Anglo-Saxon civilization. The prairie loam lands are in a condition of evolution or progression, and being the most fecund, the great centres of population, which multiplied generations will produce, will be located within the boundaries given. Much of the far western land is arid and uncultivated. The Staked Plains are the most notable example. Western Texas will be invaded in time by the miner; for its mineral wealth, as already revealed, is considerable. The tide of immigration to this section will doubtless reverse the general order of things, and move eastward through Arizona. Railway communication, hereafter spoken of, from the Pacific, will materially contribute to this result. At present the extreme point of eastern encroachment is the city of San Antonio, which is only a city of the Anglo-Saxon by virtue of conquest, and marks the limit of a daring, brilliant, and intellectual civilization, whose impulse was eastward, and which built a garden in the plain about the time that the French took root in Indiana, and the good people of New England were exercising themselves about the Salem witchcraft delusion. It is reasonable to assume that history may repeat itself in this instance.

The wooded country of eastern Texas yields a rich variety of useful woods—yellow pine, cypress, red and white oaks, live-oak, hickory, pecan and cedar predominating. The Trinity, Sabine, Neches, Angelina, San Jacinto, and other rivers afford rafting facilities and water-power at times, although water is an uncertain commodity in the State, and nearly all mills have steam-engines. A new road will soon bisect the lumber districts, springing from Denison, near the Red River, and traversing the State to Sabine Pass, which is sixty miles east of Galveston, and already an important lumbering point.

The transcontinental division of the Texas and Pacific, as well as its main line from Marshall westward, affords an outlet for the northern section, while the International and Great Northern road passes through its western tier of counties, and a road toward New Orleans connects Orange, on the Sabine, with Houston. Before the construction of the railroads one of the greatest difficulties which the prairie settler had to encounter was the scarcity and extreme cost of lumber. It sold as high as sixty and seventy dollars per thousand feet, and was often hauled hundreds of miles by ox teams. The Texan lumberman finds his market toward each of the cardinal points of the compass. The cleared lands in the valleys yield a good quality of cotton, to the extent of a bale of five hundred pounds to the acre. Some rice is grown upon the lowlands bordering the Gulf, as well as the staple known as Sea Island cotton.—*Harper's Magazine.*

Benzole and benzine have been generally regarded as synonymous, but certain pharmaceutical works now apply the term benzine to a light petroleum product. True benzole is soluble in half to three quarters of its weight of alcohol, while the petroleum spirit requires six times its weight.

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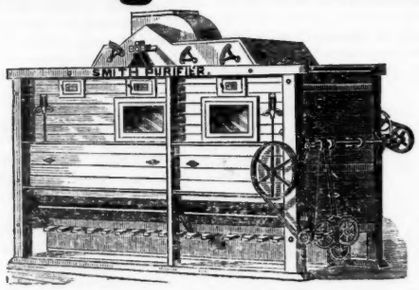

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It purifies middlings or returns from hard spring or soft winter wheat thoroughly and without waste.

It is the only machine that has the right to use the **Traveling Brush,** the **Sectional Draft,** the **Pockets,** and many other important features, and carries with it the right to use the

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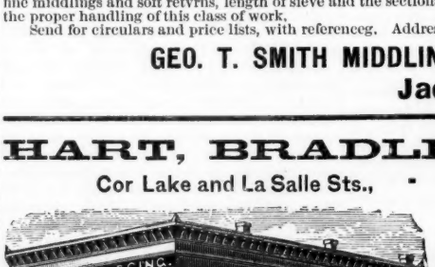

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COTTON and JUTE---ALL SIZES,
SUPERIOR QUALITY--Made to Order.

As the result of the international show at Emerson, Manitoba, the banner is awarded Dakota for general display of farm products; premium to Manitoba for the wheat crop; Minnesota complimented on its extensive display of grain from different points.

Senator Bruce says the Freedmen's Savings bank investigating committee are going to make some startling revelations.

Stanley has started on another African tour.

An American Colony in Brazil.

Soon after the close of the war a number of Southern planters emigrated to Brazil, where, slave labor being permitted, they hoped to continue in the way which was ended by the abolition of slavery in the southern states. The emigrants were mostly roughs from southern cities who were induced to go by the generous efforts of the Brazilian government and a desire for adventure; with the rest was a goodly sprinkling of those who had reason to fear the restoration of law and order. After the aid extended by the Brazilian government had ceased, far the greater part returned to the United States, many at the expense and by the aid of the government. A few who had taken some property and their families with them took up land and began farming. Few found it for their interest to buy slaves, as indian labor is quite as cheap, and the laws of Brazil place many restrictions upon slave owners in regard to their treatment and sale. It is of the latter class of colonists that I purpose to speak. An unusual interest has been felt in Brazil since the new steamship line has been started, and many are going to endeavor to start in business there. I spent one year in the vicinity of the colony of Santarem, and a few facts in regard to it, may be of interest at this time.

Santarem is situated on the Amazon, between 500 and 600 miles from the sea. Some of the finest land in the empire lies within a few miles of that little city. It was here that a large portion of the emigrants settled, the others going to one of the southern provinces. The Brazilian government furnished them houses until they could select plantations and build, and also paid them $40 a month apiece for the first six months by way of inducement for emigrants to go to that country. This premium was ample, and as the terms of taking land were easy, at the end of six months such as intended to remain and were willing to work had taken from 500 to 5,000 acres of the best land and cleared enough for crops and build comfortable but rude houses. About the same time several English families settled in the infant colony, and as their receptions and projects were similar to the Americans I have included them in the following statistics, which are the result of careful inquiry, and a personal acquaintance with all the remaining colonists. Before giving these figures it may be well to say a few words about these colonists, their habits and pursuits. They are very hospitable, and though rather sensitive on the subject of the war, and disposed to criticise "Yankee rule," any American traveller will be sure of a warm welcome and generous hospitality. Perhaps this fact may have something to do with the glowing colors travelers bestow upon this self-exiled community. When they first settled they tried many experiments, and as almost anything can be raised there, a mere statement of the soil's productions gives a false idea of their value. There is but one industry that has ever prospered sufficiently to secure the necessaries of life, and that is the manufacture of cachaca, a kind of rum distilled from fermented cane juice. Corn, rice, sweet potatoes and garden vegetables of inferior quality are raised for home use. Mandioca also by a few, but sugar cane is the staple. Even coffee, sugar and cotton are usually bought. With a few exceptions, their food and clothing are of the coarsest kind. Many live for months with no other food than dried fish and mandioca meal, and perhaps some fruit and vegetables, and occasionally a little game or salt beef dried in the sun. The poorest laborer in the United States can buy with his earnings more luxuries in a month for his family than one sees in a year in any home, save two or three, in the colony. Even white bread and butter are too expensive for most families. No comment, however, will so correctly give the colonists' estimate of their own success as the following statement of their numbers. Could those now there get the means to return I know from their own admissions that the number remaining would be far less than it is now. The number who have actually settled at Santarem is 210; have left or died since, 154; there are in the colony now, 56; of whom are children born there, 14; of the 210 original settlers there remain 42.—*Cor. N Y. Herald.*

"That's Where You Fool Yourself."

The colonel, a rigid martinet, is sitting at the window of his room, when looking out he sees a captain crossing the barrack-yard towards the gate. Looking at him closely he is shocked to observe that, the rules and regulations to the contrary notwithstanding, the captain does not carry a sword.

"Captain?" he calls from the window; "Hi, Captain; step up to my room for a moment, will you?"

The captain obeys promptly, borrows a sword of the officer of the guard-room, being at the foot of the stairs, and presents himself to the colonel in irreproachable *tenue.*

The colonel is somewhat surprised to see the sword in its place, and having to invent some pretext for calling his subordinate back, says with some confusion, "I beg your pardon, captain, but really I've forgotten what it was I wanted to speak to you about. However it can't have been anything important; it'll keep. Good morning."

The captain salutes, departs, returns the sword to its owner and is making off across the barrack-yard, when he again comes in range of the colonel's vision,

The colonel rubs his eyes, stares; says softly to himself, "How in thunder is this? Dem it, he hasn't a sword to his waist;" then calls aloud, "Captain! Ho, Captain! One moment please."

The captain returns, borrows the sword again, mounts the stairs and enters the colonel's presence. His commanding officer stares at him intently; he has a sword, he sees it, he hears it clank.

"Captain," he stammers, growing very hot, "it's deuced ridiculous, you know, but—ha! ha! I'd just remembered what I wanted to say to you, and now—ha! ha!—it's gone out of my head again! Funny, isn't it? Ha! ha! ha! Losing my memory. Never mind. I'll think of it and write you. Good morning."

The captain salutes, departs, returns the sword to its owner and makes for the gate. As he crosses the barrack-yard, the colonel calls his wife to his side and says, "See that officer out there?"

"Yes."

"Has he got a sword on?"

The colonel's wife adjusts her eyeglass upon him, scans him keenly and says: "He hasn't the taste of a sword."

The colonel: "That's just where you fool yourself! He has."

The last party of tenant farmers sent to Canada to investigate the advantages of settlement in the Dominion, represent portions of Scotland and the northwest of England. Seventy farmers from Sweden have sailed, intending to settle in Manitoba. If their undertaking proves successful, they will be joined by six hundred Swedes next spring.

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A FOUR YEARS' TEST of this Company has shown that it costs its Policy Holders LESS THAN ONE-HALF the rates charged by Stock Companies, besides giving the SAFEST KIND OF INSURANCE to its members.

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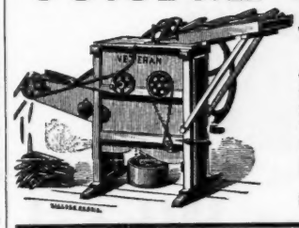
Veteran Corn Sheller,

FOR POWER AND HAND,

With Fan, Feed Table, Band Wheel & Crank.



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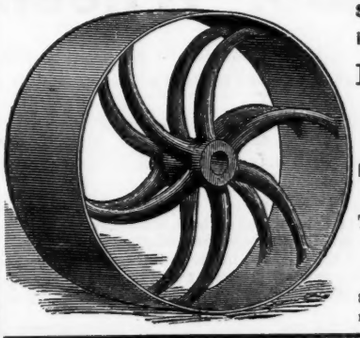

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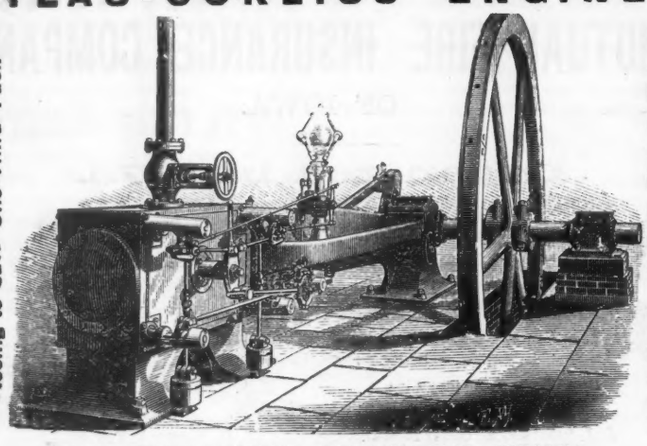

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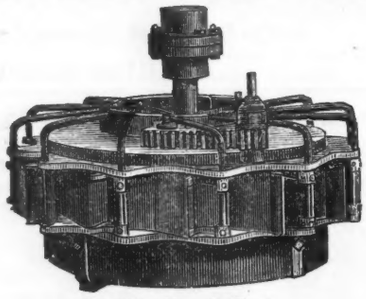

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We invite the attention of Millers and others using water power to our wheel. It is the cheapest wheel for a given power in the market, and is guaranteed to give entire satisfaction, or it may be returned at our expense. It excel all others in the following points:

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As we wish the superiority of these wheels to be fully demonstrated to the satisfaction of every purchaser, we offer to ship them to any part of this or any foreign country, to any responsible party, at our own expense, and allow a sufficient time to prove the claim made for them, and in case of non-satisfaction will bear the expense of re-shipment.

This wheel has thoroughly demonstrated its superiority in practical use over all others, and arrangements have now been made to manufacture it under improved plans which will enable the wheel to be sold at about one-half the price of other wheels.

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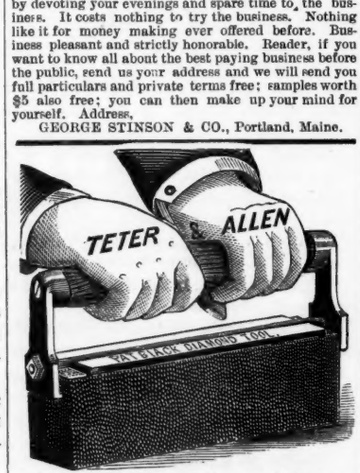

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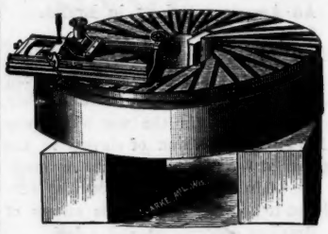

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Adapted to fine, or coarse, light or heavy face, cracking, fleecing off smoothly, or furrowing level and true to any angle. It works perfectly, and is adjustable to all kinds of stone dressing required by millers. It saves time and money, improves the quality and quantity of the flour and makes a light offal.

The cost of mill picks, with the rubbing, grinding, tempering and express charges all saved by using this machine.

For particulars apply to

Benton Diamond Buhr Dresser Co.,

La Crosse, Wisconsin.

JOHN C. HIGGINS,

Manufacturer and Dresser of

MILL PICKS

164 W. Kinzie Street,

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Picks will be sent on 30 or 60 days' trial, to any responsible miller in the United States or Canadas, and if not superior in every respect to any other pick made in this or any other country, there will be no charge, and I will pay all express charges to and from Chicago. All my picks are made of a special steel, which is *manufactured expressly for me* at Sheffield, England. My customers can thus be assured of a good article, and share with me the profits of direct importation. References furnished from every state and territory in the U. S. and Canada. send for Circular and Price List.

BOOKWALTER ENGINE.

Compact, Substantial, Economical, and Easily Managed. Guaranteed to work well, and give full power claimed. Engine and Boiler complete, including Governor, Pump, etc., (and boxing)at the low price of

3-Horse Power - -	$215.00
4½ " " - -	245.00
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JAMES LEFFEL & Co.,

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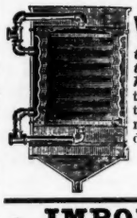

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WHEAT HEATER!

thoroughly and properly toughens the bran on the *hardest* or *driest* wheat; heats the wheat *evenly*, and improves the flour and milling generally, as no other Heater in the market does. Send for Circular,

GRATIOT BROS.,

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IMPORTANT TO MILL-OWNERS!

The GATE IS TIGHT-SHUTTING, EASILY OPERATED, and has no Complicated Gears or Traps concealed under cover.

PAMPHLET containing REDUCED PRICES and Testimonials of [illegible], also Catalogue of Milling Supplies, sent free.

It is extensively used in this and Foreign Countries!

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For Shafting, Pulleys, Hangers, and Cog Gearing, or

MILLS COMPLETE

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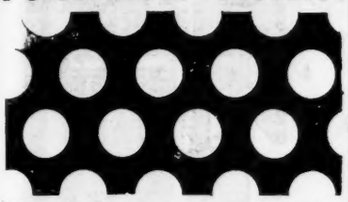

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Copper, Iron, Brass or Zinc.

Any width up to fifty inches wide, and all thicknesses up to one-sixteenth.

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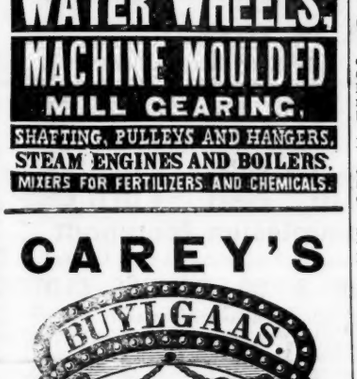

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$300 A month guaranteed. $12 a day at home made by the industrious. Capital not required; we will start you. Men, women, boys and girls make money faster at work for us than at anything else. The work is light and pleasant, and such as any one can go right at. Those who are wise who see this notice will send us their addresses at once and see for themselves. Costly outfit and terms free. Those already at work are laying up large sums of money. Address.

TRUE & CO., Augusta, Maine.

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Turbine Water Wheel.

The most scientific application of the water ever made.

This Wheel Has No Superior in the World.

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Manitoba, and the
Black Hills,

NEW YORK,
PHILADELPHIA,
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New England, the Canadas, and all

EASTERN AND SOUTHERN POINTS.

2 ROUTES

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3 DAILY TRAINS

—BETWEEN—

Chicago, St. Paul and Minneapolis

The Chicago, Milwaukee and St. Paul Railway is the only Northwestern line **connecting in same Depot in Chicago** with any of the Great Eastern and Southern Railways, and is the most conveniently located with reference to reaching any Depot, Hotel or place of business in that City.

Through Tickets and Through Baggage Checks to all Principal Cities.

Steel Rail Track, thoroughly ballasted, free from dust. **Westinghouse Improved Automatic Air Brake, Miller's Safety Platform and Couplings** on all Passenger cars. **The Finest Day Coaches and Palace Sleeping Cars**

This road connects more **Business Centers, Health and Pleasure Resorts,** and passes through a finer country with grander scenery, than any other Northwestern line,

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Gen'l Pass. and Ticket Agt.

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CHICAGO & NORTHWESTERN RAILWAY,

Forming a Through Line without Change of Cars, between

ST. PAUL & CHICAGO, BELOIT, MADISON & BARABOO and making Close Connections at CHICAGO for NEW YORK, PHILADELPHIA, BALTIMORE, WASHINGTON, NEW ENGLAND, THE CANADAS and all EASTERN and SOUTHERN STATES.

It is the ONLY LINE running

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And making direct connections with St. Paul & Pacific, Northern Pacific, and St. Paul & Duluth Railways.

IN UNION DEPOT AT ST. PAUL.

STEEL RAIL TRACK, thoroughly ballasted and free from dust; WESTINGHOUSE AIR BRAKE, MILLER SAFETY PLATFORMS and COUPLINGS on all Passenger Cars.

NEW AND ELEGANT DAY COACHES

In connection with

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Two Through Express Trains Daily.

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AT MERRILLAN JUNCTION, for Green Bay, Grand Rapids, Fond du Lac, Appleton, Oshkosh, and all points on Northern Lake Michigan.

AT WIS. VALLEY JUNCTION, for Stevens Point, Wausau, and all points on Wisconsin Central Railroad.

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in order to save expense, trouble and annoyance incident to transfer of baggage at St. Paul, and enjoy the

BEAUTIFUL SCENERY

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Including DEVIL'S LAKE, MADISON, and BELOIT, WISCONSIN.

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Toll Cards With table for taking one-eighth toll, and making ample deduction for cleaning, etc. Grists figured out in a few seconds at any number of pounds of flour per bushel. Two for 50 cts; 6 for $1. LORD BROS., Waupaca, Wis.

The Chicago & Northwestern Railway

IS THE

Oldest, Best Constructed Most Progressive, best Equipped, Hence

THE MOST RELIABLE RAILWAY CORPORATION

Of the Great West.

It is to-day, and will long remain the

Leading Railway of the West and Northwest.

It embraces under one Management

1,158 Miles of Road

And forms the following Trunk Lines:

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"CHICAGO, CLINTON, DUBUQUE & LACROSSE LINE,"
"CHICAGO, SIOUX CITY & YANKTON LINE,"
"CHICAGO, FREEPORT & DUBUQUE LINE,"

"CHICAGO, LA CROSSE, WINONA & MINNESOTA LINE,"
"CHICAGO, GREEN BAY & MARQUETTE LINE."
"CHICAGO, MILWAUKEE & LAKE SUPERIOR LINE,"
"CHICAGO, ST. PAUL & MINNEAPOLIS LINE."

The advantages of these lines are

1. If the passenger is going to or from any points in the entire West and Northwest, he can buy his tickets via some of this Company's lines and be sure of reaching his destination BY IT OR ITS CONNECTIONS.
2. The greater part of its lines are laid with Steel Rails; its road bed is perfect.
3. It is the short line between all important points.
4. Its trains are equipped with the Westinghouse Air Brake, Miller's Platform and Couplers, and the latest improvements for comfort, safety and convenience.
5. It is the only road in the West running the celebrated Pullman Hotel Cars between Chicago and Council Bluffs.
6. It is the only road running the Pullman Palace Sleeping Cars either way between

Chicago and St. Paul, Green Bay, Freeport La Crosse, Winona, Dubuque, McGregor, Milwaukee.

7. No road offers equal facilities in number of through trains, equipped with Pullman Palace Sleeping Cars.
8. It makes connections with all lines crossing at intermediate points.

The popularity of these lines is steadily increasing and passengers should consult their interest by purchasing tickets via this line.

Tickets over this route are sold by all Coupon Ticket Agents in the United States and Canadas.

Remember you ask for your tickets via the Chicago, & Northwestern Railway, and take none other.

For information, Folders, Maps, etc., not obtainable at Home Ticket Office, address any agent of the Company or

MARVIN HUGHITT, Gen'l Manager, Chicago. **W. H. STENNETT,** Gen'l Pass. Ag't. Chicago.

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SHORT LINE,

Composed of the

MINNEAPOLIS AND ST. LOUIS,

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—AND—

Chicago, Burlington & Quincy

RAILWAYS,

Making the Shortest Line and the Best Time between SAINT. LOUIS,

and all points in the South, Southwest and Southeast,

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The Summer Resorts and Lake Country

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Also New and Direct Line Between

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Via Cedar Rapids to and from

CHICAGO, NEW YORK, BOSTON, PHILADELPHIA, And all points East.

Tickets on sale at all the important Coupon Ticket Stations throughout the South, East and West.

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of latest make and improvements on through express trains.

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$66 A WEEK in your own town, and no capita risked. You can give the business a trial without expense. The best opportunity ever offered for those willing to work. You Should try nothing else until you see for yourself what you can do at the business we offer. No room to explain here. You can devote all your time or only your spare time to the business, and make great pay for every hour that you work. Women make as much as men. Send for special private terms and particulars, which we mail free. $5 outfit free. Don't complain of hard tin es while you have such a chance.

Address H. HALLETT & CO., Portland, Maine.

RAILROAD TIME TABLES.

Chicago, Milwaukee & St. Paul R'y.

LEAVE MINNEAPOLIS.

Through Eastern and Southern express	*11:35 a m
Prairie du Chien, Milwaukee and Chicago express	*6:30 a m
Austin Mason City and Ottumwa express	*6:30 a m
Glencoe, Granite Falls and Montevideo express	*6:30 a m
St. Louis and Kansas City express	†8:20 p m
Sioux City and Omaha express	*2:50 p m
Owatonna accommodation	*4:10 p m

ARRIVE AT MINNEAPOLIS.

Through Eastern and Southern express	‡7:00 a m
Prairie du Chien, Milwaukee and Chicago express	*6:30 p m
Austin, Mason City and Ottumwa express	*6:30 p m
Glencoe, Granite Falls and Montevideo express	*6:30 p m
St. Louis and Kansas City express	‡7:00 a m
Sioux City and Omaha express	*12:40 a m
Owatonna accommodation	*9:30 a m

*Sunday excepted; †Saturday excepted; ‡Monday excepted; §Daily.

Ticket office at the new Passenger Depot, corner of Washington avenue and Third avenue south; or at No. 9 Nicollet House block.

GEO. L. SCOTT, Ticket Agt.

Chicago and Northwestern Railroad.

Depot—Washington Ave. and Dakota St. Ticket offices—No. 13 Nicollet House block, and St. Paul & Pacific depot.

LEAVE MINNEAPOLIS.—Through Chicago and Eastern express *11:45 a m and 10:35 p m.

ARRIVE AT MINNEAPOLIS.—Through Chicago and Eastern express ‡7:40 a m and †1:50 p m.

*Sundays excepted; †Daily; ‡Mondays excepted.

Connections made at Camp Douglas for Milwaukee

Chicago, Clinton, Dubuque & Minn. R. R.

GOING NORTH.

Chicago [C. & N-W Railway]	leave	10:30 a m	leave	9:15 p m
St. Louis [C. B. & Q. Ry.]	do	8:00 a m	do	8:45 p m
Rock Island	do	8:55 a m	do	9:40 p m
Clinton	do	3:17 a m	do	4:12 p m
Sabula	do	4:22 a m	do	5:09 p m
Bellevue	do	5:27 a m	do	6:24 p m
Dubuque	arrive	6:45 a m		
	leave	8:00 a m	arrive	7:32 p m
Guttenberg	do	10:05 a m		
McGregor	do	11:03 a m		
Waukon Junction	do	11:40 a m		
Lansing			leave	1:12 p m
Brownsville			do	2 40 p m
La Crosse			arrive	3:45 p m

GOING SOUTH.

La Crosse			leave	12:48 p m
Brownsville			do	1:50 p m
Lansing			do	3:15 p m
Waukon Junction			do	4:21 p m
McGregor			do	5:00 p m
Guttenburg			do	5:58 p m
			arrive	7:47 p m
Dubuque	leave	6:15 a m	leave	9:10 p m
Bellevue	do	7:26 a m	do	10:25 p m
Sabula	do	8:25 a m	do	11:30 p m
Clinton	arrive	12:40 a m	arrive	9:27 a m
Rock Island [C. B. & Q. Ry]	do	5:00 a m	do	7:00 p m
St. Louis [C. B. & Q. Ry.]	do	7:15 a m	do	6:00 p m
Chicago [C. & NW.]	do	7:15 a m	do	3:40 p m

Turkey River Branch.

Train leaves Wadena 6 a m; Turkey River 10.50 a m; arrives at Dubuque 1.20 p m. Leaves Dubuque 2.40 p m; Turkey River 5.10 p m; arrives at Wadena 9.40 p m.

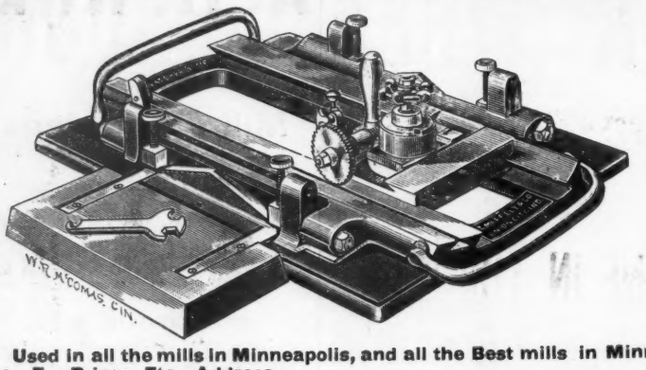
Waukon & Mississippi R. R.

Trains leave Waukon at 8 a m and 2.15 p m; arrive at Waukon Junction at 10.35 a m and 4.30 p m. Leave Waukon Junction at 11.45 a m and 5 p m; arrive at Waukon at 12.40 p m and 7.30 p m.

Pullman Palace cars run on trains between McGregor and Chicago, and between Dubuque and Rock Island

F. O. WYATT, Gen. Manager

McFEELY'S NEW FURROWING AND FACING MACHINE,



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WHEAT FLOURING AND CORN GRINDING

PORTABLE MILLS

CENTENNIAL AWARDS.

International Exhibition, Philadelphia, 1876.
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Best in the World:

Every Mill Warranted, Every Mill fully Inspected, and Every Mill placed on its Merits.

In grinding Wheat, Corn, regrinding Middlings, and in Buckwheat Flouring

We Challenge Competition.

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DOUBLE BLAST MIDDLINGS PURIFIERS,

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Buhr Mill Stones, Portable Mills. Flour Packers, Smut Machines,

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THE MOST IMPROVED WATER WHEELS,

A full class of Furnishings for Steam or Water Power Mills.

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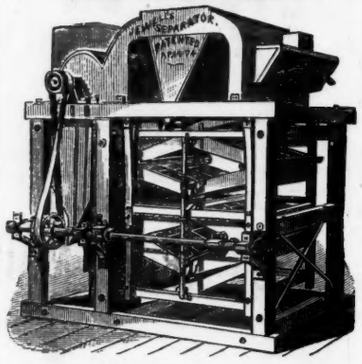
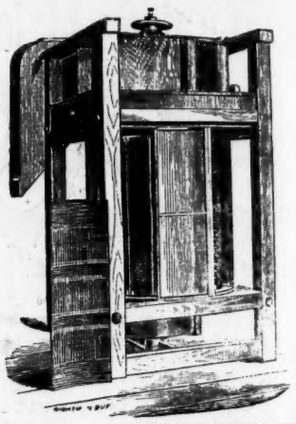
THE JEWELL



Adjustable Sieve
OAT AND COCKLE SEPARATOR.



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Upright and Horizontal Bran Dusters.

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Lockport, - - New York.

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General Mill Furnisher,

Commission Merchant,

And Sole Agent in Chicago for the Celebrated

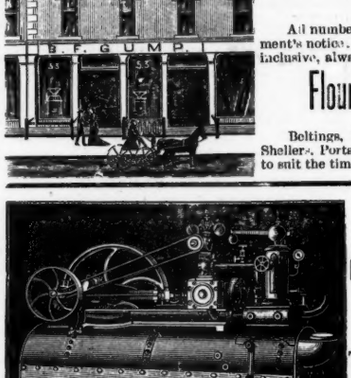
DU FOUR & CO. BOLTING CLOTHS.

(I HANDLE NO OTHER BRAND.)

All numbers kept constantly in stock to supply any order at a moment's notice. *Grit Gauze Cloths*, equal in mesh, from 000 to 6, inclusive, always on hand.

Flour Mill Trimmings a Specialty.

Boltings, Elevator Buckets, Wire Cloths, etc. Smutters, Corn Shellers, Portable Mills, and all articles necessary for mills, at prices to suit the times. **Send in your Orders.**



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Portable & Stationary Engines

BOILERS AND GOVERNORS.

2 1-2 to 15 Horse Power

These engines are especially adapted to

GRAIN ELEVATORS AND MILLS,

And the many in use for this purpose testify to their excellence.

We refer to C. A. PILLSBURY & CO., Minneapolis; PRATT & ROBINSON, Faribault, and BASSETT, HUNTING & CO., McGregor, Iowa, the latter now using fourteen.

They are STRONG, SIMPLE, DURAB E, and have many new improvements. Send for Circular and Prices to

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Smut Machines, Brush Machines, Grain Separators, and Bran Dusters.

All of the mills built last year in Minneapolis Minn., use the Richmond machines exclusively.

Sixty-five of these machines are now in operation in the city of Minneapolis alone. Twenty-six in the city of Milwaukee, Wis., and are also in use in like proportion in other leading milling points.

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Adjustable Brush Smut Machine.